

**MARINE CORPS  
GAZETTE**



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GAZETTE**

# Marine Corps Gazette

MARCH 1949

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**THIS MONTH'S COVER:** Twenty-five dollars goes to Capt Clement J. Stadler for his cover photo which, incidentally, is of Capt Stadler looking at our favorite military magazine. He got the idea for the picture at the age of 10 sitting in a barber chair between a pair of parallel mirrors. He used a Speed Graphic and considerable ingenuity to make the shot. We are hoping that more Marine photo bugs will be prompted to send their potential cover pictures to us.

## THE MARINE CORPS GAZETTE

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**THIS MONTH AND NEXT:** Did you notice that we have switched the location of the contents page? Instead of burying it in the middle of the magazine (almost) we have put it here on the inside front cover. We hope that the new location will be a convenience to you in finding what you are looking for in the GAZETTE. (Do you ever have to go through a stack of old magazines looking for something? We have to do that quite often here at the GAZETTE editorial office. Particularly irked by magazines that hide their table of contents we decided to do something about it. At least so far as the GAZETTE is concerned.)

Next month we will print the first part of *Sea Power in a Changing World*, a two part article by an eminent naval historian, Dr William E. Livezey of the University of Oklahoma. Also important, we think, is *Air Transportability in the Marine Corps* by LtCol Ormond R. Simpson which will also be in two parts.

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## ⚡ When the Telephone Rings ⚡

**Pop** hopes it's a call from Brown & Smith, saying that business deal is OK.

**Mom's** expecting a call from her mother.

**Sis** will go into a tailspin if it isn't Harry, who hasn't yet asked her for a Saturday night date.

**Buddy** hopes it's Joe, asking if he can come over.

**Family Story.** The story of Pop and Mom and Sis and Buddy is typical of many a family throughout the country. It shows the two-way value of your telephone service. The calls you get are as important as the ones you make—sometimes more so.

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# Message Center

## GI Gibberish ...

DEAR SIR:

Out of the recently concluded war have come astonishing changes in military nomenclature as popularly used. "Shrapnel" for fragments of bomb, shell, or grenade. Even artillerymen, who should be acquainted with the description of shrapnel published in paragraph 100 C.(8), page 106 of TM 9-1900, misuse the term. "GI" to mean any article of issue, be it the food that goes into the service man, the equipment he uses, the clothing he wears, or the man himself, his habits, and his habitats. Time was when its use was limited to pieces of cylindrical equipment of assorted sizes, constructed from corrugated steel, into which was deposited trash and garbage. It was listed as "can, galvanized iron" and commonly abbreviated to "GI can." Then there are the abbreviations pronounced as words. Old timers, whose memories go way back to 1941, still quiver a little each time they hear a "B.A.R." called a "bar," which brings to mind the apocryphal story of the young World War II veteran who, when he saw the famous inscription carved in the bark of a Kentucky tree, "D Boone shot a bar," exclaimed, "My God, I never knew they had automatic rifles in them days!"

Well, I surrender to "shrapnel" for shell fragments, "GI" for everything, "bar" for B.A.R., "Busanda" for S. and A. But so help me Hannah, I balk at "bed roll." You youngsters can roll up your bed and walk if you desire. (See MARINE CORPS GAZETTE, January, 1949, line 1 of Lt Schwaneke's article and line 7 of the editor's explanatory note preceding it.) But me, until beds, rolled or unrolled, go into the T/A, I'll limit my efforts to the bedding. (See NAVMC 1017-DPP, Volume II, Revision No. 5, 29 October, 1947, item #2006-107, stock #24-R-100.)

ROBERT BLAKE  
BrigGen, USMC

Each month the GAZETTE pays five dollars for each letter printed. These pages are intended for comments and corrections on past articles and as a discussion center for pet theories, battle lessons, training expedients, and what have you. Correspondents are asked to keep their communications limited to 200 words or less. Signatures will be withheld if requested; however, the GAZETTE requires that the name and address of the sender accompany the letter as an evidence of good faith.

## Pistols? Carbines?

DEAR SIR:

Re the November Message Center plea of radio-burdened Lt Dolan for the issue of a pistol to platoon leaders to replace the carbine. ... WO Nowak cannily observed in the January Message Center that a platoon leader actually engaging an enemy would find difficulty using the SCR 536, no matter what his own weapon. Somehow communication via the SCR 536 must be available, but the platoon leader must not be so burdened with it that he cannot use his T/E arm.

There are several alternatives. He could find an improved method of carrying it himself, either in his pack, or slung, or at the belt, by addition of straps and pouches. Or it is feasible to have the platoon sergeant take it. He is second in command anyway, and word can usually be passed between him and the platoon leader. Probably best if the platoon leader does not have a runner himself (he should have one) is to take one man from the weakest team leader, letting this man carry it. You won't find these arrangements in the book, yet they work for the final test — combat.

But today, to reduce the rifle platoon leader's personal armament is basically wrong. Of course the book teaches that the rifle platoon leader sends his men to whatever point, in face of whatever enemy opposition. Ah, yes. ... Before the teeth of the enemy, the boot lieutenant discovers that "leader" means he who leads, not one who sends.

Marines, among the finest troops of the world, turned in the record of the war past in part because their junior officers led them, not drove them. For against strong opposition no platoon, not even a platoon of Marines, will move far from its tracks if its officer attempts to direct it from the shelter of a rock to the rear. Other services whose officer corps sometimes followed different traditions from that of the Marines, could well attest to this immutable military fact.

The book may frown on the rifle platoon lieutenant's ever acting the part of the rifleman, but the good platoon leader will be wherever the pressure on his men is the heaviest. For when units as small as a platoon are heavily engaged, the salutary effect of the platoon leader's presence upon the spirit of his men will rank equally important with his actual direction of the fight. Inevitably then, this will sometimes lead him to assume an active role in the contest if he would survive.

And with what will the lieutenant be armed? A pistol? How many can hit anything with a pistol beyond a few feet

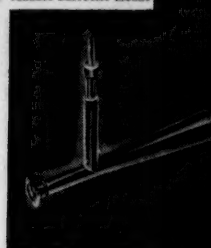
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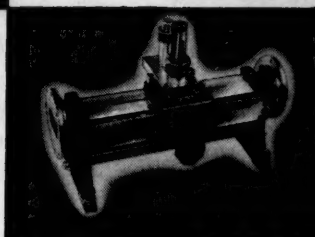
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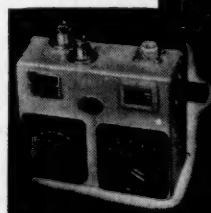
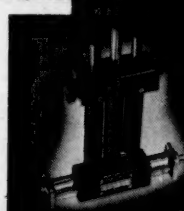
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## Message Center

continued from page 2

distant when they themselves are the target of enemy rifles at the least?

Though the proper weapon for the platoon leader is probably the carbine, during the Pacific operations of the last war, some of the finest Marine rifle platoon leaders habitually carried an M1. And though most favored the handiness of the carbine, some of them too at one time cursed its light action jammed with a few grains of sand, and reached for the nearest M1.

Pistols? Certainly, pistols are fine for the platoon leader. He can pack one as an auxiliary in the event that his carbine jams. Of course that's more bulk in addition to the SCR 536. . . .

DUDLEY COOK  
1stLt, USMCR

### Juggling Platoon Leaders . . .

DEAR SIR:

I heartily agree with 2dLt J. E. Dolan's letter in the November issue in which he pleads for the return of the pistol as the individual weapon for company officers.

In the January issue, WO Stanley A. Nowak calls the lieutenant's attention to the fact that the SCR 536 weighs only five and one-half pounds and is only slightly larger than a carton of cigarettes. "Where is the burden?" asks Mr Nowak.

I do not see how Mr Nowak can infer that the lieutenant finds the radio a burden. Lt Dolan wants to replace the carbine—not the 536. We must all agree that the radio is necessary to the company officers but I will certainly argue the point as to whether or not the carbine is a necessity if a pistol can be had.

I believe that Lt Dolan will find plenty of support from the majority of those platoon leaders and company commanders who have tried to use the radio, unfold a map and keep a carbine out of the mud—all at the same time.

C. F. McKIEVER  
Captain, USMC

### Regulars Are Reservists Too . . .

DEAR SIR:

As one among many marines who are deeply concerned with the preservation of our Corps, I was really impressed by Capt Meyers's *Making of Morale, USMCR* which appeared in last month's GAZETTE.

Two of Capt Meyers's points deserve special reemphasis.

The first is his reference to what I regard as an incomparable book for marines: *Sergeant Nelson of the Guards* by Gerald Kersh. Perhaps the reason why this book has never been a best-seller is that it is too professional; only a member

of the Brigade of Guards, or a marine, or some other *elite* soldier, can appreciate the quality and comprehending character of the way in which Kersh writes about the *elite* spirit (of which the British forces can boast so much, and the U. S. military establishment, unfortunately, so little — except in our own Corps). In the words of the book-reviewer's most bedraggled chestnut, "Every Marine officer should have a copy on his shelf."

The second and perhaps more important theme which makes the Meyers article significant is his analysis of the way in which — via our traditions — the Marine Corps Reserve meshes with the Corps as a whole. I think it is no accident that, of all the Armed Services, the Marine Corps alone can say with confidence, that among its reservists and other alumni, there are no soreheads. The main reason for this, as I see it, is that everyone who wears the Marine Corps emblem is a marine. As Meyers points out, every measure must be taken to keep this concept alive. In time of peace, when you come to think of it, what is a Regular but a sort of reservist who draws drill-pay for a seven-day week rather than for one day a week?

The important thing is that every one of us is a marine.

R. D. HEINL, JR.  
LtCol, USMC

#### Fire Support from LVT(A)s . . .

DEAR SIR:

\* It was with some interest that I read Maj Earl J. Rowse's article on *Amphibious Assault Artillery* in the December 1948 issue of the GAZETTE. In particular, his remarks on the past performance of armored amphibian units drew my attention. When Maj Rowse stated, "In the past, LVT(A)s seldom provided much fire support once the infantry had crossed the foreshore — due primarily to the fact that they were not adequately trained to execute this subsequent supporting role" and "Primarily because most LVT(A) units, when trained at all to function as field artillery, were not adequately trained to execute the field artillery role" I could not but question the source of his material.

According to official records at Headquarters, U. S. Marine Corps, one armored amphibian battalion expended 13,939 rounds of 75mm howitzer ammunition in firing artillery missions on Okinawa. This ammunition was expended in various types of fire missions, including time on target (in conjunction with field artillery battalion), preparatory fires, and adjusted fire on known targets. In some instances this fire was delivered 50 yards in front of friendly front lines. In one situation, two platoons of this battalion were the sole artillery support of the 3d Battalion, 29th Marines from 12 April to 19 April 1945, units of the artillery regiment were unable to travel the roads to get into position due to the fact that the bridges had been destroyed. A total of 27 concentrations were fired during this period with observed results of "very good to

continued on page 6

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## Message Center

continued from page 5

excellent." In addition, numerous concentrations were refired with smoke to mark enemy targets for support aircraft.

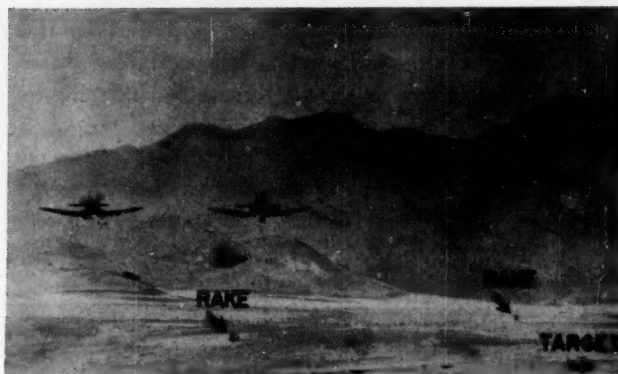
A second LVT(A) battalion, which supported another Marine Division during the Okinawa operation, expended large amounts of ammunition and was considered by that Division's artillerymen a well trained, efficient battalion. In light of the above, it is considered that an explanation of Maj Rowse's statements that LVT(A) battalions were never adequately trained to fire as artillery is in order.

LOUIS METZGER  
LtCol, USMC

### Hold Your Fire, Corsairs . . .

DEAR SIR:

In the November issue of the GAZETTE there is an article about VMF-214. In this particular article I found a mistake which should be corrected for the benefit of the men working on the rocket range where those pictures were taken. I per-



... not targets, but rakes

sonally worked on that range for a period of about one year. The picture enclosed is where I found the mistake. Under the center is a small stand called a "rake" by the range personnel. You stated that it is the target. You can also notice another of these under the plane on the far right. The target can not be seen because it would be to the right of the picture. The place you designated to be the targets is where a man is stationed to spot hits on the target. There is a piece of metal in the shape of a rake that can tell the distance the hit is from the center of the target. Both of the stations are an equal dis-



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tance from the center of the target. They form a 90° angle. Each rake has a field telephone to report its hit to the "harp." The "harp" is a wire half moon object with wires at different angles. The operator can tell the dive angle by use of the harp. After the hit is called in from each rake it is positioned on a plotting board and then relayed to the aircraft.

I have given you a detailed description of what is at El Toro rocket range. I just hope some pilot doesn't think that is the target when I'm out there! I'm afraid you might have changed some pilot's mind about our original target, so will you please straighten it out before one of us comes back with a nice size rocket hole through us, if that much.

THOMAS O. DUNCAN  
Sergeant, USMC

ED: Our apologies to all the range personnel we may have endangered. We went by the author's caption.

*Are there any questions?* If there are send them to the GAZETTE and we will try to find the answers. One of the purposes of the GAZETTE is to serve as an unofficial source of official information. If your question is of sufficient general interest, it will be printed in *Message Center*. Otherwise, you will receive a personal reply.

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Test Coordinators Maj D. M. Danser and Maj J. S. Hudson pause before chart that is posted in hallway to remind Testing and Educational Unit of its mission. The T&E Unit is in old Women Reserve area in Quantico, Virginia.

## Professional Examinations

☛ "CONGRATULATIONS ON YOUR SELECTION! ALL SET for the exams?" About twelve hundred Marine officers can look forward to this type of greeting early in 1949.

The reestablishment of an evaluation program to measure the professional ability of candidates for promotion is not an unexpected development. Pre-war marines had to demonstrate qualification for promotion by means of professional examinations. As of 1 January 1949 post-war marines will again have to meet the same requirement.

The new evaluation program introduced by Letter of Instruction No. 1605 has the same objective as the pre-war program—to improve continually the standards of professional skill in the Corps. The major element of any evaluation program is the formal examination. Significantly the only change of importance brought about by

the reestablishment of evaluation procedures is the method of measurement to be employed.

### Modern Methods of Measurement

☛ THE MEASURING DEVICE used before the war is known as the "essay" or "free response" type of test. Examinations in each subject consisted of ten problem tasks which required long-winded written responses. Two glaring defects characterized this method of testing. First, a test which consists of ten questions cannot hope to sample widely over any sizeable field of subject matter. Second, the outstanding characteristic of this type of examination is *subjectivity* in scoring. Subjectivity results when competent evaluators cannot agree as to the value of a response to a problem task. This form of appraisal occurs when the examinee responds by expressing his answers in the form of wordy statements. Subjectivity is also introduced by the lack of ability of the examinee to express himself clearly.

The Commandant's order instituting the new evalua-

---

**By LtCol Richard W. Hayward**

Photos by Sgt Charles R. Strathman

---





The Officers' Subjects Section is responsible for compiling officers' professional examinations. Present at this panel are (seated) Maj Boyer, Capt Burris, LtCol Totman, and Capt Caldwell. Standing is LtCol Best, OinC.

tion program states: "Modern methods of objective examinations will be utilized. It is intended to measure the professional ability and extent of study rather than the capacity of the memory. Multiple choice questions will be used. Determination of an unsatisfactory score will be made by the Naval Examining Board (Marine Corps). Each examination will be revised annually to keep abreast of developments in that field. Numerical or relative results of the examinations will not be published. Only the mark of satisfactory or unsatisfactory will be entered on the officer's file."

*Objectivity* in an examination depends upon the elimination of the bias, opinion, or prejudice of the person who grades it. Objective evaluation means that the same value is assigned independently to an examinee's solution by competent evaluators. Problem tasks in an objective test are so worded that only one answer fully satisfies the requirement of the questions. The very nature

of some problem tasks permits objective evaluation. The computation of the number of assault transports required to lift specific troop units and their equipment under stated conditions calls for a definite sequence of steps and results in a definite answer. Competent evaluators should have no difficulty in agreeing perfectly on the appropriateness of the procedure used by the examinee and the correctness of his answer.

(Before discussing the multiple choice form of test, it should be understood that this is only one of a variety of forms of objective measurement. The names of other forms clearly indicate their character. The popular true and false test, as well as matching, listing, classification, completion, and short answer tests, are all well known forms of objective examinations. Annual revision of examinations called for by the directive governing the administration of professional examinations might well re-

**Although this article is written concerning officers' examinations, enlisted exams will follow exactly the same procedure and pattern. The new method of grading is an accurate and dependable measurement of professional ability**

SUBJECT: Tactics - ground - airborne troops - cooperating aviation NUMBER 901497

As used in conjunction with airborne planning, what does the term "cooperating aviation" mean?

A) all aviation that assists in the preparation and execution of an airborne mission

B) all combat planes that assist in the execution of an airborne mission

C) all combat aviation that assists in the preparation and execution of an airborne mission

D) all planes and personnel that assist in the preparation and execution of an airborne mission

REFERENCE: Fm 100-5, p. 294 ANSWER: C

CONSTRUCTOR: Burris RANK: \_\_\_\_\_ DATE: \_\_\_\_\_

Fact ☐ Apply ☐

Questions after they are approved are entered on numbered file cards. These are kept at T&E.

[illegible]

Reverse of question card is used for statistical analysis of question's value. IBM system is used.

sult in the employment of a combination of two or more of these forms after 1949.)

### Validity and Reliability

● PROFESSIONAL EXAMINATIONS are administrative devices employed to measure the extent to which the examinee has succeeded in acquiring professional skill in relation to the standards established by Headquarters Marine Corps. They must possess two characteristics. They must be *valid* and *reliable*—that is, accurate and dependable measures of the examinee's achievement.

How well a test actually measures what it is intended to measure is referred to as its *validity*. Obviously, the most effective method of testing an officer's ability to command a regiment in an amphibious assault is to give him the regiment and set up the assault. This is one of the criteria desired in measuring the professional ability of a candidate for promotion to the rank of colonel. The examination is used in place of the criterion itself, since it provides the desired measure of achievement with much less expenditure of time and effort. Reasonable expectancy of obtaining satisfactory validity in an achievement examination can be assured by answering these questions: Does the scope of the examination adequately sample the desired area of knowledge? Having established

the scope, does the individual test requirements present the problems in a clearcut manner?

The *reliability* of an examination depends upon the efficiency with which a test measures what it is intended to measure. The best testing ground for determining relative reliability is the formalized course of education. The type of instruction conducted at the Command and General Staff College and the Marine Corps Schools furnish ideal research areas for the analysis of the effectiveness of measuring devices. The examinations used are designed to measure the student's achievement with respect to the mission of the school. Experience at the Command and General Staff College has conclusively demonstrated that reliability has been improved by objectivity in evaluating a student's performance. If a test efficiently measures what it is *intended* to measure, it will be valid and reliable. It follows, therefore, that reliability is really an aspect or phase of validity.

Realizing that the examinations will be accurate and dependable measures of the examinee's achievement, re-examine the list of study references published as Change Number One to Letter of Instruction No. 1605. Comparing requirements for validity with the formidable list of study references for each rank should provide a clear definition of the area of knowledge involved. Furthermore, the background of experience of the candidate should facilitate determination of the relative importance of the various segments of this area.

## Coverage

7 IN THE TRADITIONAL essay type of test, the burden of writing was on the examinee who had a considerable task in formulating responses. In the objective type test the Board does most of the writing, the examinee selecting and indicating the response by placing a heavy black mark in the space provided. This permits the inclusion of an average of 250 questions or problem tasks on the multiple choice form of examination—a tremendous expansion, when compared to the average of ten questions presented in the free response type of examination. Despite the broadening of the area that can be measured, it should be borne in mind that even modern methods of examination will only be capable of sampling the entire field. Realizing that examination tasks will be selected to properly represent the entire area of learning, the examinee begins to appreciate the task of preparation. Greater emphasis is given to the statement, “It is intended to measure the professional ability and extent of study rather than the capacity of the memory.”

### Multiple Choice Form

**WHAT DOES** the multiple choice form of objective examination look like? It consists of an examination booklet and separate answer sheet. Normally, these tests are designed to be completed within a specified time limit,



so the cover of the booklet contains an injunction not to open until directed to do so. If it is intended that the test will be machine scored, it is customary to issue a special type of pencil to facilitate machine evaluation. The answer sheet consists of a single sheet of heavy paper. An orderly array of figures and capital letters, trailed by an obedient file of blue dots, calmly await their function of recording the examinee's responses. The figures correspond to the numbered problem tasks set forth in the booklet, while the column of As, Bs, Cs, and Ds identify the choice of answers selected by the examinee for each question. When required, a situation map with pertinent overlays is also issued. However, maps and overlays are not used to record answers. They serve to set forth the general and special situations which form the background for the problem tasks presented. Maps and overlays have demonstrated great value in presenting examination tasks involving strategy, tactics, intelligence, logistics; problems of planning, execution, decision, and the like.

Being, in all respects, ready and eager to get under way, the supervisor gives the signal to open the booklet. The examinee finds at the top of the first page the word *Directions*, and at the bottom another injunction *Don't turn this page until you are told to do so*.

The tension eases momentarily, and the examinee reads the directions. The first significant item that he encounters is the fact that he will have — hours to complete the test. He then encounters—

After each question, you will find several answers. Read each question carefully, then decide which *one* of the four choices best completes the statement or answers the question. If more than one choice seems satisfactory to you, select the one that you consider the *best*. Try to answer every question, but do not spend too much time on any one question.

You have a separate answer sheet on which to mark your answers. All the answers are to be marked on that sheet. **DO NOT MAKE MARKS OF ANY KIND ON THIS TEST BOOKLET OR THE SITUATION MAP.**

Here are some practice questions to show how to mark your answers on the answer sheet.

1. The officer in command of a company is normally—

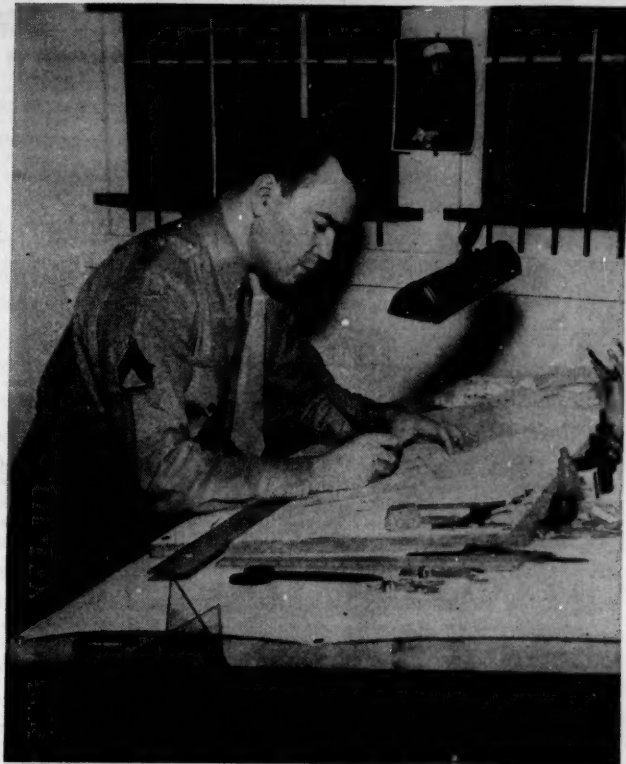
- A. a major.
- B. a captain.
- C. a 1st lieutenant.
- D. a 2d lieutenant.

Now look at your answer sheet. After number 1, there are four pairs of dotted lines labelled A, B, C, and D. Since the correct answer is "a captain," make a heavy black mark between the lines labelled "B" after number 1 on your answer sheet.

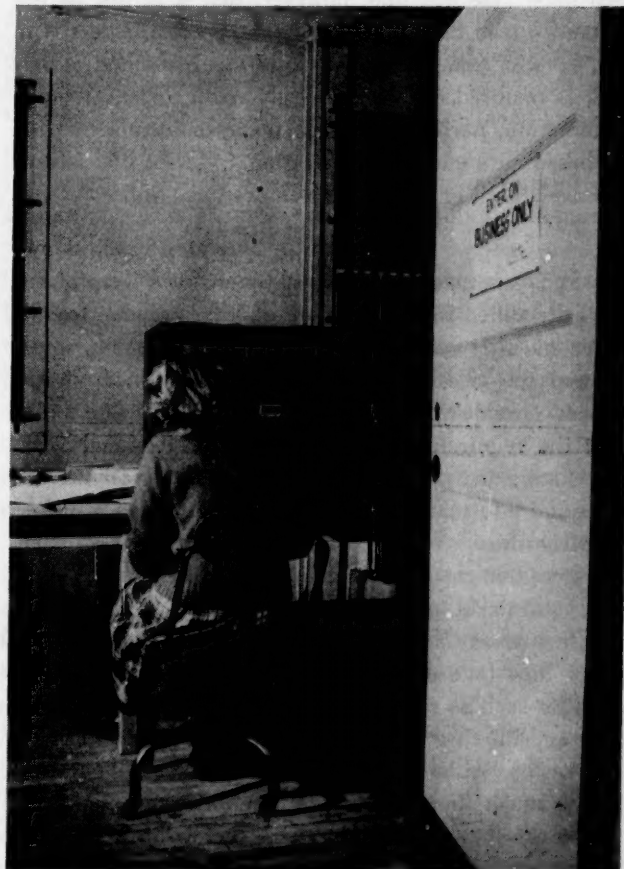
Always be sure that the number of the question corresponds with the number on the answer sheet.

If you change your mind after marking an answer, be sure to erase the marking very thoroughly.

It is extremely doubtful that examinees will encounter many questions as easy to answer as the test question



Drawings to illustrate some examination questions are done by draftsman SSgt Michael A. Garbus.



Completed cards are carefully filed by Miss Nancy J. Bare. Barred windows are security measure.



NAME		RANK		SIGNATURE	
LPSMC		MOS (SSH)		O.F. (EF)	
SERIAL No.		TITLE OF TEST			
DATE					
ORG.					
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120
121	122	123	124	125	126
127	128	129	130	131	132
133	134	135	136	137	138
139	140	141	142	143	144
145	146	147	148	149	150

Examinees will mark answer sheets with special pencils. Grading is to be done mechanically. Form is standard IBM answer blank also used by the U. S. Army.

used here. He will find, however, that it is just as important to read the problem in this type of test as it is in any form of examination. Failure to understand clearly what is required can be extremely costly in any type of examination, particularly when numerous problem tasks are based on a continuing situation, a device that is very effectively used in the multiple choice form of test.

### Problem Tasks

IT IS APPARENT that the multiple choice form of test is ideally suited for the purpose of informational testing. Statement after statement, question after question, would demand the selection of factual information from the choices provided. But, would this type of examination meet the requirements of measuring professional skill? It is undoubtedly true that possession of a vast amount of factual information bearing on his profession would be of extraordinary value to an officer. Nevertheless, extensive measurement of information alone would not satisfy the requirement of measuring professional skill. The examinee must be called upon to demonstrate that he knows how to use his knowledge. Higher level mental activities such as reasoning, formulating decisions, evaluating and interpreting situations, and judgment will have to be tested. Although preparation of informational questions is much simpler than preparation of tasks designed to measure these mental activities, there can be no question but that the latter should provide most of the content of the examinations.

At first glance, the evaluation of mental abilities essential in the exercise of command appears to present a complex problem difficult of solution. Assume that it is desired to test the ability of an examinee to support a judgment with appropriate reasons. Before setting up the problem to be presented as a multiple choice task, it is necessary to analyze the area of knowledge with which the examinee is supposed to be familiar. This must be done in detail and it should be done in light of the purpose of the learning achievement that is to be measured. It should be expressed in terms of the examinee's reaction. Then present the task so that four choices of a course of action are available from which the examinee is required to choose the best. This should be followed by a list of statements, one to support each course of action. The examinee can then be required to select all which support his course of action. By no means are problems designed to measure judgment confined to any one field. They can be developed to cover tactical situations, administrative problems (logistical or personnel), and even problems in law.

A simple question in administration could be covered in this manner—

1. The fundamental reason for a sound promotion policy in the Marine Corps is—
  - A. to provide an incentive for ambitious individuals.
  - B. as a reward for long and faithful service.
  - C. to make maximum use of an individual's ability.
  - D. to confer on individuals visible sign of authority.

Problem tasks to measure knowledge of organization are easily presented:—

1. A corps is composed of a headquarters, certain organic elements designated as corps troops, and in addition—
  - A. a fixed number of divisions, but no reinforcing service elements as the corps is primarily a tactical unit.
  - B. a variable number of divisions allotted in accordance with the situation, but always reinforced by a fixed number of service elements allotted by Fleet Marine Force which will enable the corps to operate the necessary administrative installations for its own supply and evacuation under all circumstances.
  - C. a variable number of divisions allotted in accordance with the situation and additional reinforcing service elements allotted by Fleet Marine Force as is necessary to support the corps in a given situation.
  - D. a fixed number of divisions and service elements to ensure a balanced force under all circumstances.

• HOW WOULD A PROBLEM task designed to measure decision or application of principle be presented in a multiple choice test? Recall that in order to achieve validity the test must be prepared within the scope of knowledge, or experience, of the examinee. Assume that it is desired to measure the knowledge of an examinee in connection with the conduct of a counterattack—a type of problem that might confront any combat unit commander regardless of echelon. In formulating the task, it is essential that the principles involved be thoroughly understood. Then set up a situation wherein an enemy force penetrates the position of the troop unit commanded by the examinee. All required information is clearly shown on the overlay accompanying the map issued with examination booklet. It indicates the depth of the enemy penetration, nature of salient created, favorable and unfavorable aspects of the terrain on both flanks of the new enemy position, and pertinent information concerning own forces.

Having presented the situation, the first question would require a decision. The examinee, in selecting one of the four choices available to him, would come up with the one indicating his decision to counterattack. The next task would then require him to select the point in the enemy position against which he would launch his main effort. From the multiple choice presented he would select a flank. This is in keeping with sound tactical doctrine in as much as most tacticians take a dim view of hitting a penetration on the nose. To measure the judgment of the examinee, the next task could require him to select a reason to support his selection of a specific flank. There would be many reasons indicating the best flank, such as terrain conditions, road net available, disposition of own

forces, supporting capabilities, and so on. The next factor to be recognized might be the requirement for coordination. This could be stated as a question which demanded the establishment of a line of departure. Additional tasks can be presented requiring the selection of assembly areas, employment of supporting arms, and so on. While the combination of tasks that can be presented in this single situation is not endless, nevertheless it is apparent that a significant area of tactical knowledge can be examined. Ten examination tasks stemming from this single situation could very effectively cover the examinee's skill in reasoning, making a decision, evaluation and interpretation. Also obvious is the fact that it matters little what size unit is involved—it could be applied from the infantry company to the amphibious corps.

The application of a little ingenuity, plus an active imagination, will result in an astonishing variety of examination tasks. The application of this technique to measurement of the examinee's knowledge of a complex subject, such as the organization and administration of the National Military Establishment, has fascinating possibilities.

The greatest distinction between the objective type of examination and its predecessors, the free response type of test, lies in the fact that the burden of writing has been shifted from the examinee to the Testing and Educational Unit which prepares the examinations for the Naval Examining Board (Marine Corps). This shift results in certain inherent values in objective testing. The fact that the examinee does not have to write long-winded answers permits measurement of his achievement directly. It is not obscured by his skill, or lack of it, in formulating written responses. Furthermore, it permits the examinee to give his full attention to the task set by the examination without the distraction of trying to express himself. It greatly increases the amount of material that can be covered. Although the task of the Examining Board has been made infinitely more complex in the formulation of tests, the arduous job of grading the examinations has been greatly simplified. Merely place them in the machine which will accomplish the job accurately and economically.

There is little doubt that the multiple choice objective form of measuring device presents an interesting experience for the examinee. Adm Mahan once lamented the fact that no matter how necessary extra-curricular reading and study might be for the professional officer, he would never be brought to undertake it unless forced to do so. Make no mistake about it! Periodic evaluation by this form of measuring device presents a definite challenge. The fields to be covered are so wide, and the capabilities of increased coverage so tremendous, that the requirement can only be satisfied by a well-thought-out plan of spare time professional study and reading.

USMC





# Our Weapons are not "One-Way"

**A BASEPLATE MCGURK  
ARTICLE**

Illustrated by Maj James A. Donovan, Jr.

“MODERN WEAPONS ARE TOO ONE WAY,” Boat Space growled as he threw his Field Manual aside and reached for one of his foul cigars.

“Elucidate, son,” Dusty drawled. “We’ve nothing better to do for the next hour so favor us with some of your ‘down to earth’ logic.”

“Down to earth!” Tex snorted. “It ought to be buried six feet under . . .”

“Pipe down, Bubblehead, while your mental superiors engage in conversation. What I meant, Dusty, was that too many weapons are only good for offensive purposes alone or for defensive purposes alone.”

“For example?” Tex sneered.

“For example, the 60mm mortar,” Boat Space answered. “The 60mm was supposed to be an offensive mortar since its low silhouette was supposed to make it possible for the crew to bring it close to the target in a firing position from which direct laying was possible. This was obviously supposed to cut down the time required to bring fire to bear on a target since you didn’t have to fiddle with indirect fire calculations. However, you know damn well that during an advance most of us just had our 60mm sections follow along after the rifle platoons. Once we reached the objective we had the 60s



**Members of the "Ale and Quail" club engage in another one of their arguments over the versatility of weapons. Boat Space maintains that our arms are good only for the purpose for which they are designed. Dusty sets him straight**

go into position to cover our reorganization which is essentially a defensive mission. Furthermore, we always had them included in our defensive plan of fire. In fact, we would have raised hell if the old man took our 60s away from us while we were defending. On the other hand, if battalion called for a carrying party while we were attacking, we always detailed the men from the 60mm section. So there you have it—this so-called offensive weapon was considered to be an absolute necessity on the defense and a damn nuisance on the offense."

"Why do you say it was a damn nuisance?" Dusty asked.

"Oh, because you had to keep them tagging along out of the way of your rifle and machine gun platoons. Just another detail to worry about when you should be concentrating on fighting your company," Boat Space answered airily.

"Why didn't you assign them a mission instead of having them just tag along?" Dusty persisted.

"Well, hell!" Boat Space growled. "Having them tag along doing nothing is bad enough but it's a lot easier than figuring out a mission for them and seeing that they carry it out. Besides, it's easier to use the 81mms because you don't have to worry about ammunition replenishment for your 60s if they don't fire during an advance."

"O.K." Dusty smiled. "You've just given the answer yourself. Why did most of us fail to use the 60s properly in the offense? Because it was easier not to worry about them. Is that right?"

"Yeah." Boat Space grinned sheepishly. "I guess, that's it."

"You're damn right that's it," Tex said. "And by admitting it we're also confessing that we weren't running our companies properly. In other words we're saying that running a company was too big a job for us and we couldn't handle all of the parts at the same time. All of these parts are furnished us so that we may have a well balanced fighting unit and therefore all of them should be employed."

"Oh, I was just as guilty as any one else," Tex said as he noticed Boat Space starting a comment. "Actually, I was probably guiltier than most since I had command of an 81mm platoon before I got my company. When I was with the 81s it used to burn me to use up my ammunition on targets that could have been knocked out by the 60s in the rifle companies. That 81 ammunition is a lot

heavier than the 60s and, although we sometimes could use jeeps, we usually man-handled most of it. Furthermore, because we fired so much on targets that should have been knocked out by the 60s, when the companies really needed our fire support we would have to limit ourselves to the ammunition we had left.

"Knowing all of this, when I did get a company I used my 60s just like everyone else. Why? Because it was easier, I guess. Anyway, I can't agree that the 60mm is a one way weapon. If used properly it can be just as useful on the offense as it is on the defense. Which of the two is its most important role is immaterial right now. The fact remains that the weapon is useful on both the offense and the defense just as it was intended to be. The 60mm was not designed to be a purely offensive weapon. The need for such a low silhouette mortar in the offensive no doubt influenced its design, that is true. However, any weapon that cannot be used on both the offense and on the defense is just excess gear to a rifle company."

"Well, maybe you're right about the 60s," Boat Space barked. "But how about the flame throwers? Now don't tell me they are anything but offensive weapons."

"He's got you there, Tex," Dusty grinned. "I've never heard of flame throwers being given a defensive mission. Usually the flame thrower operators were used as ammunition carriers or as CP security."

"That's easy." Tex yawned expansively and chuckled. "It amazes me how you youngsters could go through a war and learn so little. In our battalion we placed a flame thrower with each section of FPL guns. To be more specific, we placed a flame thrower in a position from which the operator could toast anyone approaching either of the two machine guns. If this was impossible, the flame thrower covered whichever gun was the more vulnerable. As even you know, a machine gunner must keep his gun on its final protective line until the gun is in danger of being overrun by the enemy. At that time, he is allowed to shift to a free gun so that he may live to fight again another day. On the other hand, because of the human element involved, he will sometimes shift to a free gun when he is really not in danger of being overrun—particularly if he is a replacement or improperly trained. Regardless of why he might shift to a free gun, it is most important to the entire outfit that he has no reason for shifting and therefore can be expected to fire his assigned FPL. Since a flame thrower is capable of

roasting several men at one time quickly and permanently, the machine gunner knows that he has even better protection than if he uses a free gun. The short range of the flame thrower is no drawback since, in this case, you're only interested in the enemy that is close enough to overrun the gun.

"Now another advantage is the effect that the sudden appearance of the flame has on the enemy. In fact, I would rate the casualty producing effect of the flame second to its psychological effect. Here again you have the value of the element of surprise in the conduct of your defense. Why men would rather be shot than stabbed and would rather be stabbed than burned to death, we don't profess to understand. However, it's true and knowing it we should use this fear of burning as a weapon. In other words, the appearance of the flame throwers might be just enough to cause the enemy's assault to hesitate. Once he hesitates, you've got him.

"So there you are, two obvious advantages and no disadvantages."

"Did you say no disadvantages?" Dusty inquired politely.

"How about a night attack——" Boat Space blurted and was interrupted by Dusty.

"Relax, Boat Space," he said. "That's what I was driving at.

"It seems to me, Tex," he continued, "that when you opened up with even one flame thrower you would disclose the position of your MLR to the enemy. Man! his artillery would chew you to pieces!"

"You all have missed the point," Tex said patiently. "I said that the flame throwers opened up when the enemy was close enough to overrun the machine guns firing the FPLs. When the enemy is that close he's practically on top of you. When he's that close he knows where your MLR is located. And lastly, when he's that close you

don't give a damn if he does know where your MLR is located."

Boat Space looked aghast at Tex's sacrilegious last statement.

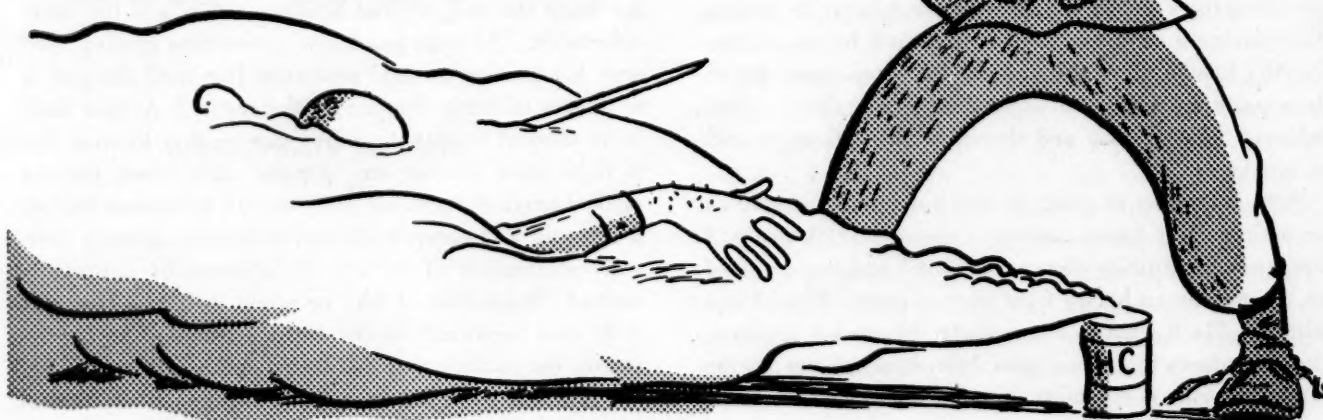
"What do you mean 'you don't give a damn'?" he yelled.

"In the first place his troops are too close to yours for him to use his artillery on your MLR," Tex said calmly, "and in the second place what advantage is there in keeping the location of your MLR a secret if he's about to overrun it, wipe it out, in other words, win the battle? Mustn't disclose your MLR. Why hell, at that stage of the game I'd have every man stand up with a flashlight or light a cigarette if I thought it would stop the momentum of the enemy's assault."

As Dusty nodded his agreement Boat Space wrinkled his forehead and scratched his short red hair trying frantically to think of something that would support his original thesis. Finally he smiled but not with very much confidence.

"O.K. I'll try another one," he said. "How about smoke? Whenever possible we use smoke in the offense.

Surprising the attacker by laying smoke on him may cause more confusion than an artillery barrage.





Now I know that we use it in the defense to screen the movement of troops and supply in rear of our MLR. However, how can we use smoke as a defensive weapon that will actually hamper the enemy's assault on our MLR?"

"Let me take this one, Tex," Dusty said as he turned towards Boat Space. "Most people, as you said, use smoke while they are attacking. However, no one expects to be smoked in return by the defender. Why should the defender want to cut down his observation and interfere with the effectiveness of his entire plan of fire? Well, actually, if it's a well organized defense with range cards and so on, it's going to be able to operate during all conditions of visibility. On the other hand, if you surprise the attacker by smoking him, there's an excellent chance that it will cause more confusion than an artillery barrage. Although you're trying to inflict casualties and an artillery barrage would certainly do that, in the long run the confusion may cause more casualties than the artillery."

"How do you mean?" Tex asked.

"Well, you blind his tanks so they have to slow down. Units will lose their direction of attack. Bunching and gaps will occur in the attacking forces. Commanders can not be sure that their scheme of maneuver is being carried out. It's more difficult for their plan of fire to function with maximum efficiency. All in all, you cause confusion and uncertainty. If this happens, the attack loses its punch and has little chance to succeed."

"Damn!" Boat Space muttered. "Suppose some guy did that to me. How could I keep control of my company?"

"Oh, it's rather simple," Dusty smiled. "You learned in school how to protect yourself against such a move."

"How?" Boat Space asked.

"By always giving the azimuth of the direction of attack. By smoking an attacker, you as the defender are simply betting that he was too lazy to give a proper attack order. If he was smart enough to give an azimuth and if he trained his subordinate units to always know the azimuth of their direction of attack, your smoke will do little more than slow him down and worry him a bit."

"I can see why it might worry him if nothing more," Tex grinned.

"For all he would know, you might be pulling a withdrawal, starting a counterattack, building up your lines, or just horseing around. Incidentally, Dusty, that white phosphorous is a damn good casualty producing agent. When a man gets a piece of that on him it will burn right on in. I've seen it and it's not pretty. The pain is so awful it drives them crazy."

"Well," Dusty drawled, "I think it's fun to sit around and figure out different ways to use the tools of our trade. For instance, on Guadalcanal we sometimes set up a .50 caliber machine gun as bait. Well camouflaged off to each side we would set up some .30 caliber machine

guns. As you know, the .50s make a hell of a lot of noise. When the Nips tried to crawl within grenade range of the .50, we knocked them off with the .30s."

"Yeah," Tex laughed, "that reminds me of what we used to do with telephone wire. Since the enemy's infiltrating groups would always try to find some of our wire to guide them to our CPs, we tried to help them. We simply secured one end of the wire out to our front and laid the wire so it could be easily followed. Instead of a CP at the other end, however, we had a machine gun. Very profitable, very profitable!"

"Although we usually consider antitank and antipersonnel mines as being defensive weapons, we used to employ them offensively," Dusty said. "At night we would send patrols in back of the enemy's lines to mine roads, trails, supply dumps, and so forth. Incidentally, the men love to take part in these dirty little tricks. It appeals to their sense of humor and relieves the monotony."

"You've got a good point there," Tex said enthusiastically. "We were in a quiet sector for three days on Saipan in a defensive position. We were near the hinge of a swinging gate movement so there was nothing to do but patrol and wait for orders to attack. Well, we found several piles of rice about 500 yards to our front. We burned all but one pile and registered our mortars on it. After dark a four-man recon patrol would move out with a SCR 536 and get close enough to watch the pile of rice. Pretty soon the Nips would start coming around for some rice. The patrol then, of course, simply moved back out of danger and called down the fire. Next morning a patrol moved out and counted the enemy dead. This went on for three nights in a row and we always got results. The whole battalion got a kick out of it and could hardly wait for the morning patrol to get in with the box score for the night."

"If you birds are going to start fighting the war, count me out," Boat Space said as he stood up and stretched. "I introduced an academic discussion on the uses of modern weapons and now it has degenerated into your favorite pastime of telling each other how smart you are and what great heroes the Marine Corps considers you."

"Your're right," Dusty laughed. "Let's get some chow. However, I think that the most fascinating thing about our profession is that there is always a better way or a new twist to be discovered if we keep our eyes open and our imagination alive. You know if I ever get a battalion, I think that I'll require each of my officers to submit a new idea every month. I don't give a damn if it's a new method of control, a new training technique, an improvement in one of our SOPs or what it is—just as long as it's new. Any of these ideas we are able to use will gain its originator a pat on the back in front of his brother officers and a little memo in my files to remind me when I'm working on his fitness report."

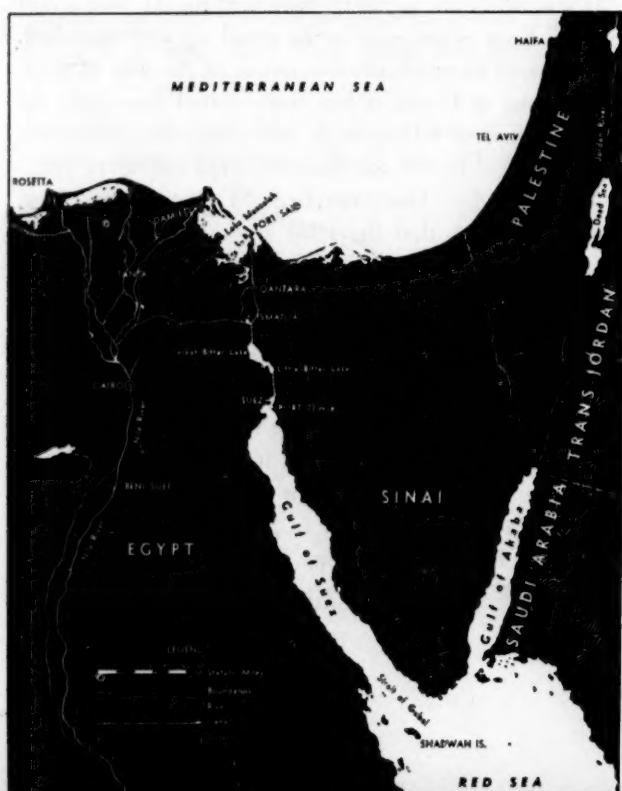
USMC





# The Suez Canal

*By Comdr Alan Villiers, RNVR*



✿ MILITARILY, THE SUEZ CANAL IS A GRADE "A" BOTTLENECK ditch between the two worst bottleneck seas in the world—the Mediterranean and the Red Sea. A look at the map will show what I mean. Anyone who holds Gibraltar, at the one end, or the Island of Perim in the straits of Bab-el-Mandeb at the other, can put Suez out of business overnight. Hostile occupation of the Greek islands, of Sicily, Crete, or almost any place else in the whole Mediterranean, must constitute a serious threat as the recent war showed, when the British had to build up their armies in Egypt by sending troops out around the Cape of Good Hope, right around Africa, and up the Red Sea to the port of Suez. Any Power who holds a piece of the Red Sea coast with a bit of a harbor, or has a foothold in the Gulf of Aden or on Socotra Island, can be an infernal nuisance. Harbors, perhaps fortunately, do

## A Grade A military bottleneck the Suez Canal is of vital importance to the Western Powers for it is the number 1 oil highway of the western world. Laden tankers carried over two million tons of oil through canal in July 1948

not abound in the Red Sea, and there are none at all on Socotra. But it is obvious that the security of the Suez Canal demands friendly cooperation, if not some measure of actual control, of the shores both of the Mediterranean and the Red Sea.

There is also the Black Sea, which has a bottleneck of its own.

The whole 87 mile length of the Canal passes through the territory of Egypt. The ports at both ends—Port Said and Suez, which includes also Port Tewfik and Port Ibrahim—are Egyptian. All the mountainous length of the Sinai Peninsula on the Gulf of Suez is Egyptian. So is the Red Sea Coast of the Gulf of Suez, and half the Red Sea besides. Stability of the Egyptian government, then, is also vital: without its active cooperation, there would be no Suez Canal. At the moment, there are elements in Egypt which do not feel particularly cooperative towards the Western Powers. There has been some outbreak of personal violence against Americans, and British—and other foreigners—in Cairo, and elsewhere, during recent months. The maintenance of Suez is vital to the Western Powers, for it is Number One Oil Highway of the Western world. Pipelines and such are all very well, but any ill-disposed Beduin or band of guerrillas can put them out of action almost at will. Pipelines do not fight back, and give easy victories. The free movement of bulk oil by tanker through Suez Canal is essential.

Look at the figures, for a moment. Traffic returns for the Canal for July, 1948, showed that no less than 2,756,000 tons of oil and its derivatives passed through, from south to north. That figure compares with 1,155,000 tons in July, 1947, which shows that the pipelines aren't sharing as much of the load as they might, if they passed through more settled areas. In the same July, 1948, tanker tonnage in ballast bound out for oil cargoes amounted to 1,372,000 tons out of a total ballast tonnage of less than one and a half millions. It is interesting, too, to note where this oil came from. Official statistics mention 517,000 tons as coming from Saudi-Arabia and 503,000 tons from Kuwait, in the Persian Gulf. Laden tanker traffic was 61 per cent of all traffic in the Canal during 1947, and is increasing.

Incidentally, there were nearly 6,000 transits of the Canal by ocean-going steamships in 1947, of a total net tonnage of thirty-six and a half millions—the largest ever recorded. This compares with less than 2,000 transits in both 1941 and 1942, when the Mediterranean was very far from being a British lake, and the Germans, now and

again, dropped magnetic mines into the Canal. This they did, however, surprisingly seldom. Perhaps the confined waters of such a place are too easily swept, and kept under surveillance. It is difficult, too, to do lasting damage to a canal which has no locks. Suez is a very different proposition from Panama, not only in this respect. The levels of the Mediterranean at Port Said and the Gulf of Suez at the other end are the same, though for years engineers said they were not. There is no Culebra Cut on Suez, either, for de Lesseps had nothing to shovel out of his way but desert sand and a bit of rock.

De Lesseps—the Frenchman (incidentally, he was not a professional engineer) who put the Canal through—figured out that the levels of the two seas were the same, when a spell of enforced idleness lying in quarantine at Alexandria caused him to look into the question, as far back as 1831. De Lesseps was a far-sighted, enterprising Frenchman with considerable influence with the reigning family in Egypt, to whom he had acted—amongst other things—as riding master. While in quarantine, de Lesseps read up the previous history of the Canal, for his was by no means the first successful attempt to link the Red Sea with the Mediterranean. There had been at least five good attempts at a Canal before his time, and at least three of them had worked, though they all depended upon the use of the Nile. Their aim was to get ships to the Red Sea at a point well south of the Gulf of Suez. There was not much point in the Ancients putting a canal through where the European wanted one, a couple of thousand years

### a background article

later, for sailing-ships could neither sail nor row against the fresh northwest winds which blow, almost perpetually, down the Gulf of Suez. If they cut a new arm of the Nile across the desert to the Gulf of Suez, they could sail away from there at a good clip; but they could get back again only with the greatest difficulty, if at all. When, years later, the Indian government maintained a fleet of fast schooners to carry the mails to Suez, whence they went by dromedary over the desert to be shipped aboard one of the early steamships at Alexandria for the passage across the Mediterranean, it regularly took as long to sail the few hundred miles from about Jiddah to Suez as it did to sail the whole of the other two thousand miles

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*Alan Villiers, who has written for us before, is a world famous sailor and traveler. Author of The Set of the Sails he is, at present, on a lecture tour in this country.*



The author's squadron of LCIs at Kabret during World War II. A large naval base, this port was used as an assault troop training base. Good beaches made Kabret ideal staging area for LCIs.

from Bombay.

So the Egyptians of old tried to cut a way through south of the worst north winds, though they also made some use of Suez. Even Roman triremes, long narrow vessels of tremendous oar-power, could not make way against the northwesterers of the Gulf of Suez, and the silt of the Nile and the desert sands finished all their canals, in time.

IN THE RUINED TEMPLE of Der-el-Bahri, on the Nile, there are carvings dating from 1500 BC which picture and record the voyage of five ships from Egypt to the Land of Punt, well south in the Red Sea, so there must have been a satisfactory canal of some sort even then. There are other records of ancient canals, of varying effectiveness. Herodotus mentions one, saying the canal in his time was wide enough to let two ships pass, and it took several days to sail through it. It is probable that a few thousand years back, the Nile had a main exit somewhere near where Port Said now stands, and ships could easily sail up to the site of Cairo. From that area, there is a natural depression running eastwards to Lake Timsah (through which the present Suez Canal passes), and this could be deepened to provide a waterway for the small ships of those days, fairly easily. Labor was no problem and bulldozers were unnecessary. When the Pharaoh tried to restore the Canal in the year 612 BC he lost over 100,000 slave laborers to heat and disease, and this did not worry him. The slaves were not even provided with tools, for they could scoop up the desert with their hands.

Necho, in fact, gave up his project when an oracle—a sort of presidential right-hand man who pulled gags

about stars and omens, and such things, but had plenty of real influence—said if he persisted, the reopened canal would be of more benefit to Egypt's enemies than to herself, for it would make the country that much more easily invaded.

De Lesseps read up all this and much more, for history was—and is—rich with stories of Suez Canals and attempts thereat, and of the overland crossing of the Isthmus. At the time, the British were the most recent overlords of the desert crossing, and their great Peninsular and Oriental Steamships Company—among others—had brought the overland passage down to a fine art. They had a lot of capital tied up in staging points and workshops and such, for their passengers and for their vessels, and had perfected the journey to India with the short overland break. They took a dim view of F. de Lesseps, and put every obstacle in his way.

However, by 1859, de Lesseps turned his first sod, with a company worth millions of francs behind him and a concession for 99 years: ten years later, his Canal was at last opened. For 10 years after that, the cautious British still insisted on their mails being unloaded at both ends, and sent overland, in case a steamer fouled the Canal or the sides slipped in, or the desert blew in, or something. These things, indeed, happened often enough and still sometimes happen, for there is much sand, much desert, and more than enough wind at times, and many a steamer otherwise tractable refuses to steer in the narrow waters of the Canal. But the Canal has never been out of action for long, from the day it was opened. Before long, Bismarck was calling it "the cord in the neck of the British Empire that connects the spine with the brain."



Today it is not only a cord in the neck of the British Empire.

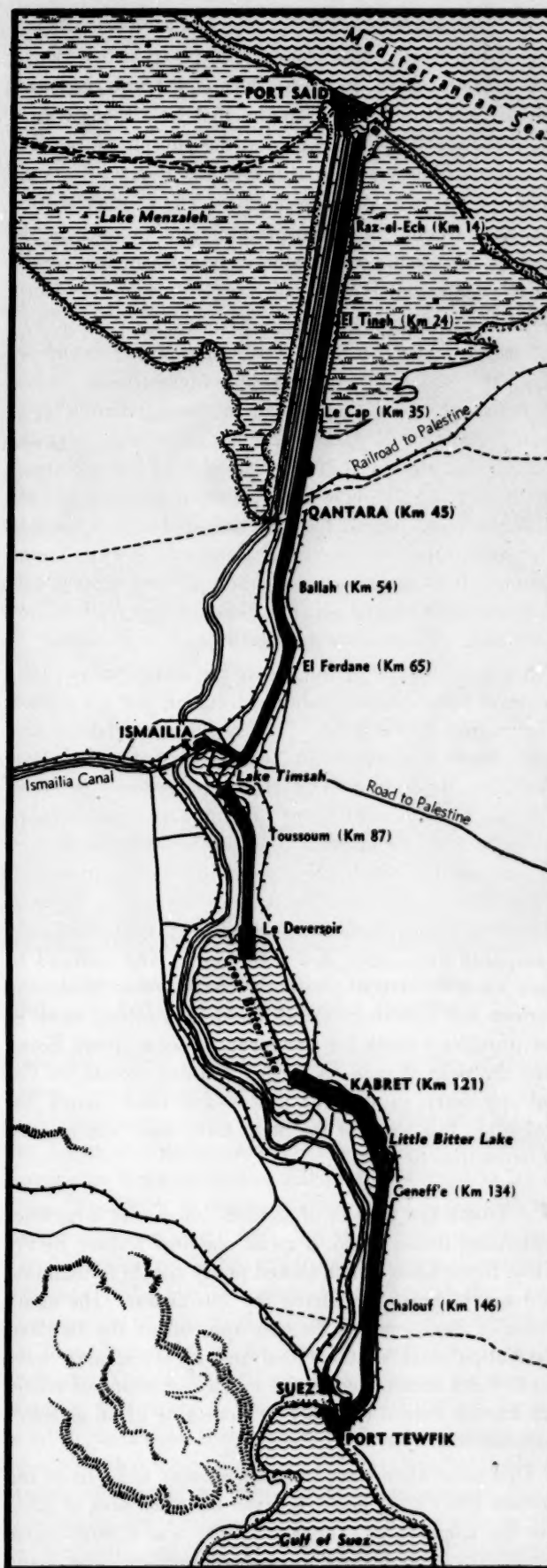
By the way, a point not often mentioned is that the original Suez Canal Company, formed by de Lesseps, made the Canal the property of the company for 99 years. Thereafter it was to become Egypt's. That will be in 1968.

There has been plenty of political trouble over the Canal, and there probably will be more. Within less than 10 years of its first opening, there was a serious project to spend \$40,000,000 on building a rival because of high-level shy-acking: now and again to this day, similar projects arise. One such was to put in another canal which would come out in the Gulf of Akaba, using in part, the valley of the Jordan and the Negeb. But if it ever went through—and there are plenty of engineering problems—such a canal would present the same strategic problems as the present one does and would probably be even more vulnerable.

The Suez Canal itself is too important a source of wealth and revenue to Egypt for its profitable working to be seriously imperilled. The company which operates it is described as Egyptian, though its head office is in Paris and its chairman is M Francois Charles-Roux. Personnel employed is cosmopolitan. Many of the pilots are French, and a considerable proportion British. Of late months—a straw in the wind, perhaps—the Egyptian authorities have been putting serious difficulties in the way of keeping the pilot force at strength, for there have been interminable delays in granting the necessary visas and such to non-Egyptians. Few of the pilots are Egyptian, for the Egyptians are not a seafaring race, despite that passage to the Land of Punt. Being literates when other peoples were not, they wrote up what they knew about and they wrote on durable stone; and so have taken the credit for much.

The situation about delays for personnel replacements and expansion was serious enough for the recent annual general meeting of the Suez Canal Company, in Paris, to bring it up. The chairman announced that the matter was "under discussion"; but there is still some shortage of pilots.

Here are some facts on Egypt and the Canal as it now stands. Egypt is mainly desert; without its one river—the Nile—it would be all desert. Of a total area of about 385,000 square miles, the cultivated and settled area—the valley and the delta of the Nile—comprise less than 14,000 square miles. The population is around 15 million, almost all Muslim, followers of the prophet Mohamed. They speak Arabic, often very badly; the very great majority form an oppressed class of serfs. There is great poverty, and there is also great riches: but the riches are often in the hands of foreigners. Cotton, wheat, some sugar, and dates are grown; of these the most important is cotton, and high prices have been the rule in



recent years. There is a King, who is an important member of the Arab confederation: there are also a Senate and a Chamber of Deputies. Suez is the only Egyptian port of any consequence on the Red Sea, though there are moorings for ships to load at the phosphates berth at Kosseir, further south. Alexandria and Port Said are the more important Mediterranean ports. The weather is good the year around and very pleasant and bracing in the winter. Almost the whole country is north of the tropics. Cairo's better hotels were much the resort of rich Europeans in former years, seeking a sunny winter.

Several ranges of mountains intersect the desert between the Nile and the Red Sea, the highest being nearest to the coast where they reach, in places, slightly more than 7,000 feet; but there are no mountains near the Canal. The highest "hill" in that part of the country is about 40 feet. The land between the mountains and the Red Sea coast, where they do not approach it, is low. The greater part of the Sinai Peninsula is very mountainous. It is described as a desert of rock, gravel, and boulders, with rugged gigantic peaks, ridges, valleys, and tablelands. There are a few fertile spots and oases.

South of Egypt is the Anglo-Egyptian Sudan—the cause of some present political troubles, not yet settled. The million square miles of the Sudan are a fairish way from the Suez Canal; Port Sudan, 700 miles from Port Tewfik, is the only port of importance. There is a rail link via Khartoum to Cairo. Egypt itself has over two and a half thousand miles of main-line railroad as well as another thousand miles or so of light agricultural track. Railroads connect the ports of Alexandria, Rosetta, Damietta (all on mouths of the Nile), Port Said, and Suez, with each other and with Cairo. The railroad to Suez runs for much of its way beside the Canal; the curious and sometimes rather antiquated rolling stock in use provides a break for passengers in ocean liners, bored with the sight of sand. A further railroad crosses the Canal—by ferry in time of peace—and heads north for Palestine; this some of the Stern Gang have had a crack at, from time to time.

☛ THERE ARE PLENTY of airfields, some very large ones quite close to the Canal. I recall one near Kabret, by the Great Bitter Lake, which looked pretty simple to maintain and was of great use during the '39-'45 war. The abundance of good weather, the easy approaches, the excellent navigation mark of the Canal and its lakes, must have made fliers accustomed to the harsh conditions of northern Europe regard the place as something of an airman's paradise.

That same abundance of good weather and—more important still—good beaches, made the same area of great use for amphibious exercises. There was a large naval establishment at Kabret throughout the war, and many

assault troops were worked up there for Sicily and elsewhere. For part of the war, I was associated with this establishment at any rate to the extent of loaning them some LCI(L) for beaching exercises. Both in the Great Bitter Lake itself and along the Gulf of Suez outside, excellent beaches with unimpeded approaches and little or no swell or surf, were to be found in abundance. There are also plenty of reefs, but the place is well charted. We were able to stack up LCI(L) by the score, and LCT and LCG(L) as well, along the beaches at Kabret. There was little rain. Sandstorms sometimes arose and were somewhat inconvenient: in summer there were sticky days. But on the whole, the set-up was ideal. There was very little sickness, apart from the inevitable upset stomachs which always bother northerners on their first visit to such parts.

☛ THE MOTOR ROAD to Cairo was good and it was easy to make the journey. Near at hand, the town of Ismailia (population about 30,000: it is the administrative HQ of the Canal Company, and has a small slipway and repair facilities) was close by, and well worth a visit. There were good roads throughout the Canal area, on the southern side. There were ample repair facilities of all kinds at Port Said, which used to be considered one of the lowest sinks of all humanity but has been cleared up considerably. (It is still no place for a girls' school.) I noticed several small shipyards for building wooden caiques on the northern bank by the Canal entrance, opposite Port Said. Some of these caiques looked seaworthy and fast little vessels, though their rig was a bit fragile. The working vessel of the Canal area and the Nile is, of course, the ancient felucca, a vessel of remarkably low freeboard, one large decrepit sail, and an extremely small and often poverty-stricken crew. There are lighters enough for any purpose; coaling is from lighters, the coal—like most things—being carried by hand, in small baskets, by an "endless chain" of more or less submerged human beings. Only in China could one ordinarily see grimmer labor scenes.

By an international convention—for what such may be worth—the actual Canal is neutralized. It is supposed to be exempt from blockade, and open to all in peace and war. The actual length of the Canal from Port Said lighthouse to Suez Bay is 87½ miles, of which 76 miles are perfectly straight. Sixty-six and a half miles are canal proper; the other 21 pass through three lakes—Lake Timsah, the most northerly, and then the Great and Little Bitter Lakes, in that order. There are dredged channels through all three. The width of the Canal at the surface varies, naturally, with the inclination of its banks: it is never much less than 100 yards, and it is deep enough to give passage to the liner *Ile de France*, registering 46,247 tons. The depth throughout is never less than 37 feet: it will soon have a depth of 42 feet. Only





**Ships passing Port Said. The levels of the Mediterranean here and at the Gulf of Suez at the other end are the same. Suez has no Culebra cut. Only sand and a bit of rock needed shoveling.**

*Burton Holmes/Ewing Galloway*

the largest liners and the most awkward floating-docks cannot use it.

Milestones along the eastern bank show the distance from Port Said lighthouse in miles and tenths; similar stones on the western bank give the distance in kilometers. There are more than a dozen places along the Canal where vessels may secure to the bank in order to permit another ship to pass, and there are plenty of mooring bollards along both sides, to serve for securing vessels which have to lie over for any reason.

There is little current, though there is a six-foot rise and fall of tide at Suez. The Nile falls from November to April and rises from June to October: it is a curious and so far unexplained fact that the current in the Canal varies with these two periods. From November to April the general set of the current between Port Said and the Great Bitter Lake is northward, and from June to October, southward. The average rate is seldom more than

one knot. There is no perceptible tide in the Canal between Port Said and the Bitter lakes.

A fresh-water canal runs from the Nile at Cairo to the Canal at Ismailia, and thence—or rather, from just outside the town—a branch follows the railroad as far as Suez. The depth in this fresh-water canal varies with the height of water in the Nile, but is generally about four feet. There is also a branch from Ismailia to Port Said. The so-called Lake Menzaleh, which lies at the Canal entrance about Port Said, is now a dry, flat, sandy plain on its eastern side; in the west, it receives some water from the Nile, and its depth depends upon the flow of water in that river. A War Memorial—1914-'18—by the side of the Canal about halfway along its length, is a reminder that both wars came very close to the dull stretch of waters. Allenby's great campaign into Palestine, when the Turks were on the German side in the earlier world war, was to some extent based on Egypt:



so was the landing at the Dardanelles, when the Austrians first made their name as fighting men. In the recent war the Germans were uncomfortably close when they were turned back at El Alamein (there was some premature destruction of port installations at Alexandria); and the Syrian campaign against the Vichy French was fought to secure its left flank. Just what the Egyptian fellaheen thought of both wars, nobody has said: but in Egypt, wars come and wars go, and poverty abides forever.

At any rate there were Italian agents highly placed where their influence might have achieved more than it did, longer than enough, in Egypt. Not for nothing did the Allied forces' term of Wog—wily Oriental gentleman—originate in that country; the verb "gyp" has an unpleasant association. The so-called lower classes of Egypt have been oppressed for centuries: when they really break out will be the day—if they ever do. Much of the publicized troubles around Cairo and such places are hot air blown off by students, many of whom are not Egyptian. Arabs from Kuwait and Nejd attend the university at Cairo: there is a special house for the Kuwaiti, who are not numerous. When a lot of Arabs get together from the different parts of Arabia—or even from the same part—there is always, at the very least, considerable intrigue. It is an old custom of those parts, and it has been brought to a high art in Egypt. But it would be easy to over-rate its importance.

THE GREAT AND LITTLE BITTER LAKES are separated by a point of land projecting northward at Kabret, and occupy a depression which must formerly have had an outlet on Suez Bay. There is plenty of room in the big lake for ocean-going steamers to line up at anchor, waiting their turn to pass through the rest of the Canal; and there is ample room to stack up a large amphibious fleet. Depths are from 18 to 42 feet. Beach exits are good. From Little Bitter Lake to Suez the Canal passes through hard, and in some cases rocky, ground. The rocky places are marked by can buoys. There is a bit of a creek off the Canal leading to the town of Suez itself, with a depth of from four to nine feet only. The ports on the actual Canal are Port Tewfik—or Thewfeek, or Thewfik—and Port Ibrahim, and which precisely is which even the Canal authorities don't seem to know. Before the days of the modern Canal, the base there at the Suez end for the overland route was known as Port Ibrahim, but when the Canal was opened the company called its basins and works there Port Tewfik.

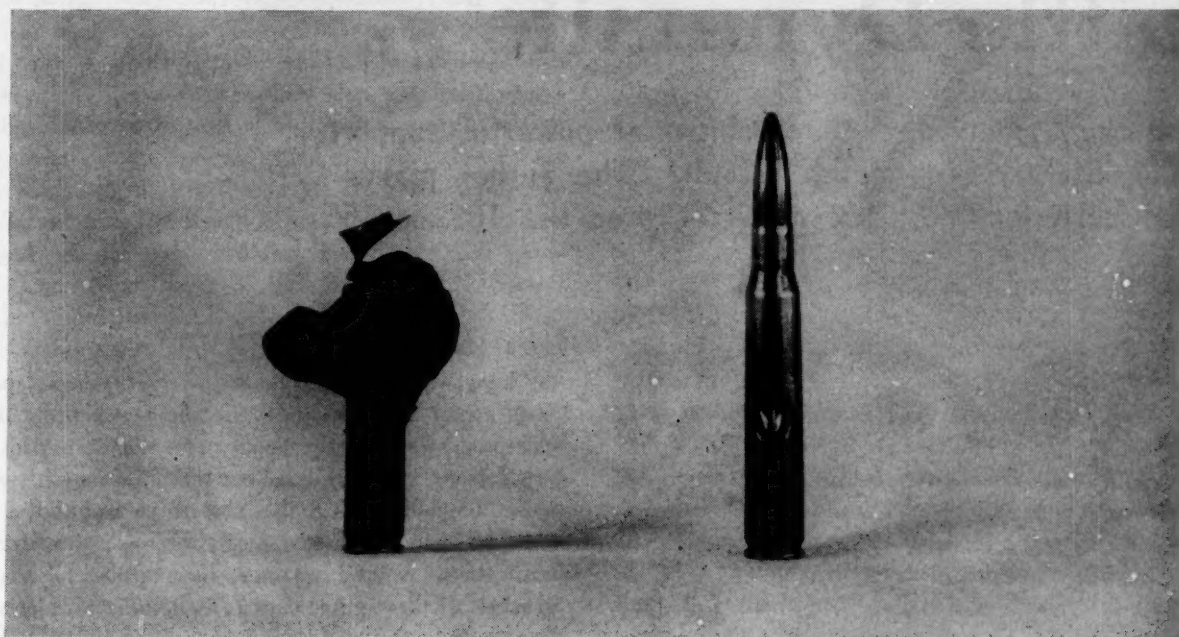
The town of Suez (also known to history as Arsinoe, Cleopatra, and Kolzum) is not now as important as it once was. It stands on a part of the desert projecting eastwards, with mudflats to the south and Suez Creek on its northeastern side. Port Ibrahim has a new and an old harbor, with breakwaters and plenty of water. There is a railroad to Suez and thence to the main system:

there are steamers to everywhere, except the nearby Sinai Peninsula.

Suez, like all the main ports and towns of Egypt, is connected with the cable and wireless systems of the world. From Suez there are direct cables to Perim, Aden, and Port Sudan. Fresh provisions are fairly plentiful. There is a graving dock at Port Ibrahim, with reasonable repair facilities. Large stocks of fuel oil are held.

The shores of Suez Bay are low and sandy, except on the west and southwest, which are bordered by reefs and banks. On the northern side is a desert plain, and on the eastern side another which extends for some dozen miles inland, rising very gradually to hills of no great elevation. Depths in the Bay are from six to 10 fathoms, but there are coral patches. The Gulf of Suez extends about 170 miles south-southeastward from Suez town to the southern extremity of Shadwan Island, with a width varying from 10 to 25 miles. Both sides are bordered by coral reefs with some outlying patches; but there are passages through them for small craft. They do not compare with the fringing reefs of the average Pacific island, but they can be bad enough. One thing to remember, in case you are ever on an amphibious exercise in those parts, is that the northwest wind can shift very suddenly and bring up a nasty surf. Northerly winds prevail in the gulf nearly the year around, and the wind is generally lightest near the western shore. Sandstorms can be a curse but do not generally last for long.

Any consideration of the Canal area should bear in mind the roadstead of Kosseir, or Qoseir, though at first glance there may not seem much connection. But Kosseir is a port—using that term in the widest sense—on the Red Sea at the point where that coast most closely approaches the Nile; and as such, it is a sort of back door to the Suez Canal. By a short overland journey and slipping down the Nile in anything that floats, an invading force could very rapidly reach the Canal area—always provided, of course, that there was nothing to stop them on the river. As a matter of fact, this was once a very popular route for reaching both Cairo and Alexandria, in the old days of considerable European intercourse with India, before the opening of the Canal. Passengers homeward bound sailed in anything they could find from Bombay to Kosseir, where they landed in a small bight southward of a low sandy point (sometimes a big swell rolling in made landing impossible for days, for there was no real harbor there then and there is none now, though the place is an important shipping center for phosphates). Thence they crossed the desert, usually by donkey, and reached the Nile about Luxor. Thence, the passage was by felucca or, later, small river steamer, as far as Cairo. The main reason for landing at Kosseir was to void the heavy head winds blowing down the Gulf of Suez, for the 250 miles which separated Kosseir



The ruptured .30 caliber armor piercing cartridge shown in the photograph was caused by a shooter dropping two boxes of cartridges from about waist high. The cartridges were packed in twenty round cartons and in falling, one box apparently fell on top of the other, causing the point of a bullet in the

upper carton to puncture the cardboard carton and strike the primer of a cartridge in the lower box. As can be seen in the photograph, the explosion was quite violent in that it drove the bullet into the cartridge case of another round.

HKJ

from Suez could take a fortnight to beat against.

Outward bound towards India, it was a different thing. Then passengers used to make their way from Alexandria to Cairo and thence by camel or donkey across the desert to Suez itself. It was possible to make this journey in about three days. To this day, many passengers prefer to land and make the overland journey through Egypt rather than remain aboard ship for the rather uninteresting transit of the Canal. They go by the same old desert route, but now they speed along on good highways, in sleek automobiles from the best plants in Detroit and France. From Cairo to Suez in this way can be done in two or three hours.

Kosseir is an easy place to pick out from the sea, for it has an overhead loading transporter from a phosphates magazine to an offshore loading berth, where vessels tie up to buoys. There is an old fort which can be seen from the north for ten miles or so. In these days, even the old pilgrim trade towards Jidda has deserted it, and apart from a little grain and the phosphates, it offers almost no trade. It is doubtful if there are more than 3,000 persons living there, though it is a station of the Frontier Camel Corps.

So there it is. The Suez Canal, second largest in the

world (reckoning Panama as the greatest though it is not in fact as long as Suez) and in some ways the most important, must also be in many ways the most difficult to defend unless the defenders are either extremely powerful in their own right or have a host of allies, or both. Bordered on the north by the Mediterranean, to the west by the Libyan desert, in the east by the Red Sea and to the south by the so-called Anglo-Egyptian Sudan which is neither English nor Egyptian, its hinterland of Egypt offers many roads to the possible invader. If he comes down from the north, there are the important Mediterranean islands of Cyprus and Crete to help him; and there are ways down through Palestine, or even through Persia and across the beaten track from the head of the Persian Gulf through Iraq and Syria.

On the face of it, Suez is really defensible only by a great world power. As a corollary, it could only be attacked by such. Any threat to it in time of war would be a serious thing, for to consider one item only, the extra haul around the Cape of Good Hope from Kuwait or Bahrein with oil, say, for the United Kingdom or the United States, would add at least 8,000 miles to the voyage. And, next war, ocean-going, depth-inhabiting submarines look like being a pretty serious menace indeed.

USMC



# "Little Dynamite"

Would the 75mm solve the problem of powerful support for the infantry in a beach assault? The author makes a good case for the pack howitzer over the 105 or 155

By Capt Thomas N. Greene

IN THE DECEMBER ISSUE OF THE MARINE CORPS GAZETTE we had with us once again the classic mislabeling of a 155mm howitzer as a 105mm. That one example was sorely needed to exactly balance the number of times picture editors with deadlines have called a 105 the 155. Now the 75mm pack howitzer is the answer to that editor's prayers. It looks like nothing else on earth and it "shoots good" too. And there are other advantages . . .

But first, let's bend graciously in the direction of LtCol A. J. Stuart, whose thoughtful article in the August, 1948, GAZETTE teed off what promises to be an interesting free-for-all on what the well-dressed Marine division will wear and carry over the beaches of the future. He pointed out that John Rifleman needs help in that first hour after he steps out of the surf. And in the December GAZETTE Maj E. J. Rowse took up the torch with some ideas about how to get that early-hour help from the artillery. Both of these officers have considered the VT fuze, among other interesting developments. They have come to the sound conclusion that overhead cover would be very nice to have. You can get overhead cover and mobility by the use of modified tanks, self-propelled guns, and armored carriers. You get cover and mobility, and—inevitably—you get an armored division. Is this what the Marine Corps needs?

The articles just mentioned did not state that armor is the final answer, and the writer is not prepared to state that it is not. But there are difficulties. In the same December GAZETTE LtCol D. H. Carter brought up some points about beach mines that would make interesting reading to a tank crew starting over the sand. Armor requires bigger transports, bigger landing craft, and more men on the beach, and so leads to making bigger targets. The enemy might, or might not, use atomic weapons if the target were big enough. In any case, a concentration of armor produces the same inevitable reaction in enemy artillerymen and pilots as a tap on

the knee with a rubber mallet—he kicks back, quickly. With armor your landing craft and beach problems are increased mechanically. Supply gets tougher. Also, when you get into armored divisions, the point may be reached when it could be said that the Corps is building up a "second land army" in defiance of the ground rules of unification. Now if we must have armor to crack the beaches of the future, we can lick these problems. But first, let's look at a few things that can be done in the way of getting highly portable, but powerful support for John Rifleman on that beach in his first hour ashore without armor.

THE FIRST NOMINATION is "Little Dynamite" — the 75mm pack howitzer. The class will notice that this weapon comes apart. Designed for about 10 mules or eight marines to carry, it can be landed or manhandled anywhere. You could land it from rubber boats with the Recon men and UDTs the night of D-1 if you had to. The first packs ashore on Tarawa came in by LCR, LCVP, and LVT. Some were carried, broken down into man loads, over the damaged pier. They were used to clean out a couple of emplacements in the immediate battery area and when in position they did not begin to occupy the 120,000 square feet of space recommended by "the book."

Right now the pack howitzer is a sort of optional piece of equipment that can be drawn from depots when asked for. Probably a major reason we still have them is that no one could think of anything to do with such a silly-looking weapon. Well-elevated, the pack looks somewhat like a Pomeranian climbing a fence to bark at a big burglar. It traverses only a few inches to either side, so that a crewman has to pick up the trail and shift it for large changes in direction of fire. And when it fires the recoil makes it bounce like a Model T on a dirt road. But you can hit a dime with it.

Along about the Marianas, the Marine Corps said goodbye to the pack howitzer and installed the 105mm as the basic artillery piece. The experts went into things such as the bursting radius of shells and their penetrat-

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ing power as compared with their weight. They decided that by firing fewer and bigger shells more fire power would be achieved. This was entirely sound—on paper. If you look in the firing tables you will find some figures in fine print. These figures show that you can't expect two consecutive shells to land in the same place. You can figure them out to find out the oval pattern that your shells will make at a given range. It looks about like the "Beaten zone" of machine gun fire. At most ranges this zone of dispersion will be from 25 to 200 yards long. That's what the book says for both the 105mm and the 75mm P.H.

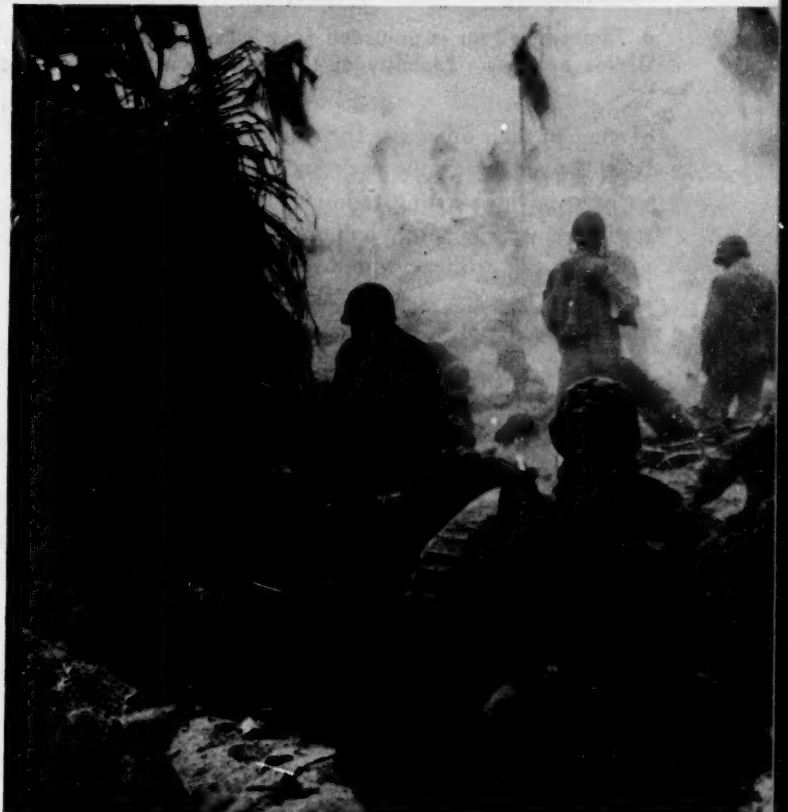
The 105mm for looks compares with the pack about like an M1 compares with a musket. It swivels smoothly back and forth and sits solidly when it fires. You'd expect it to be the more accurate weapon. According to the book, both are about the same, but that hasn't been the writer's experience. As a forward observer the writer has often called 75mm shells down within 50 yards of himself and the front lines. He wouldn't call 105s closer than 200 yards from even an armored, mobile OP. He has seen five out of six consecutive 75mm pack shells pass through a 3-foot opening in an ammunition bunker at a difficult range; and he has seen six out of six 105mm shells miss targets 50 feet across which were already zeroed in. The fewer, but bigger 105mm shells may give more fire power, but each one that misses the target is more fire power wasted. The bigger shells are, oddly enough, more affected by wind and temperature.

Admittedly, the 105mm howitzer shoots farther and hits harder, but the pack has other advantages. It takes less room on a crowded beach to set up a battery. It can be dug in sooner, and it can be hidden more easily. If you can't provide mobile cover, concealment is the answer to the VT fuse. The pack is also mobile. It can be quickly manhandled or towed with either a jeep or weasel as prime mover. On Iwo Jima the 105mm got its first Marine Corps test as the basic direct-support artillery piece. Its hitting power was useful, but it was very hard to move in the ash beach that weasels and 75mm packs could have negotiated. Whether 75mm packs would have been able to get more hits on pillboxes with AP shell than the 105s is a matter of opinion. It can be argued as long as match shooters weight the '03 against the M-1.

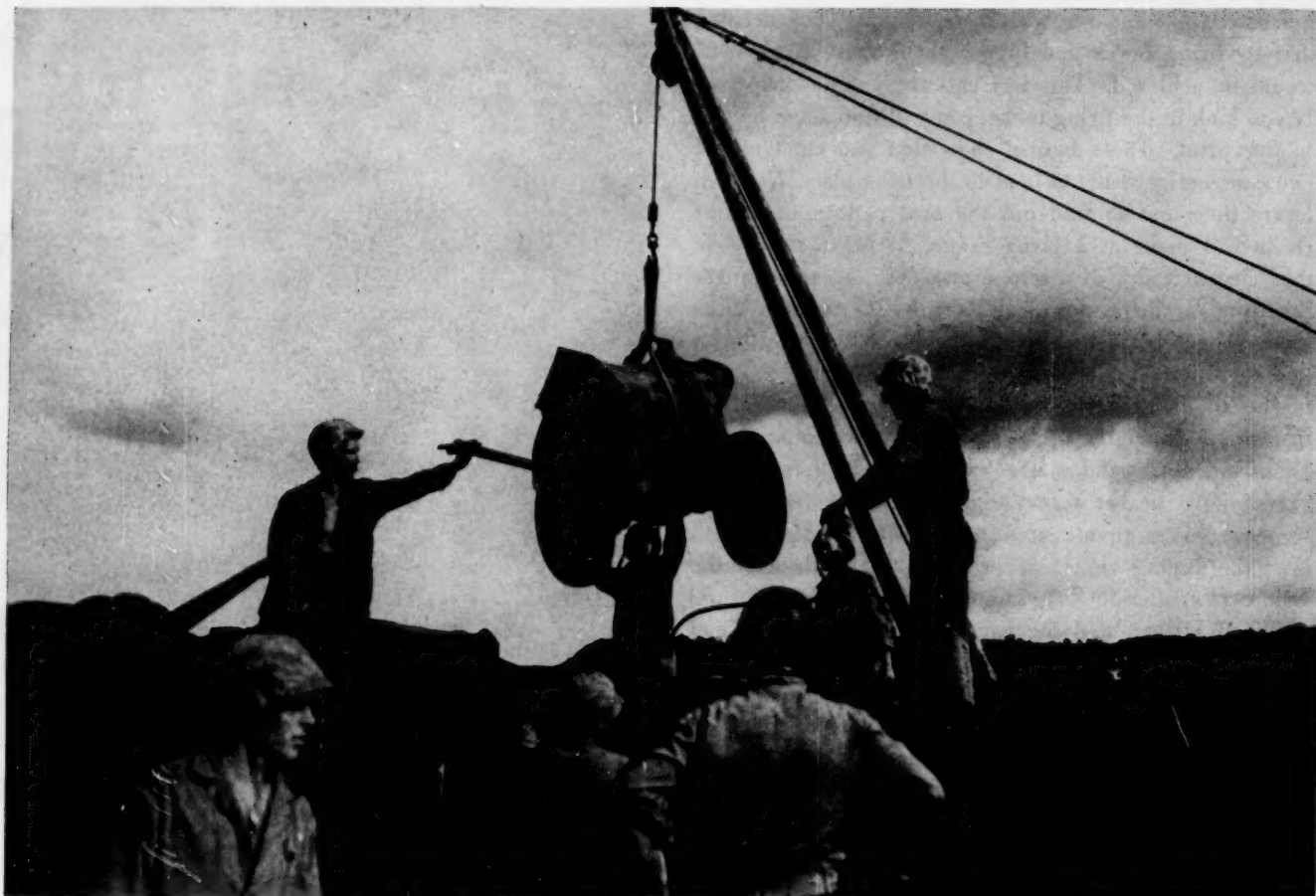
Getting back to John Rifleman on that beach, the 75mm pack can be landed sooner to help him. It takes less room, and can be hidden better. The vital ammunition can be handled more easily. This opens the question of whether we can't take another look at some of the weapons we have now. The next step is to improve those weapons. Present-day basic artillery comes mostly from the pre-World War I era. It is understood the Russians and Germans used rockets to increase the range



Marines carried 75mm up cliff on Tinian piece by piece to fire on Japs seeking cover in a cave.



Gun crew directs fire of 75mm howitzer against Japanese troops during the campaign for Tarawa.



A 75mm howitzer is unloaded from one of the amphibious DUKWs which brought it and its crew ashore on Tinian on D-plus one day. Mobility of this weapon makes it an ideal gun for close support of infantry during beach assault.

of some of their otherwise conventional artillery. We may be able to re-design the pack and add range to it. While we're at it, the bursting radius of the shell and its penetrating power can surely be improved. Let's examine the need for SP artillery with overhead cover, but at the same time let's see what we can do with a light, compact, and highly portable artillery weapon.

The 4.5" rockets suggested by Maj Rowse for the new artillery T/O we have now. They are good for covering an area, and may be improved. This weapon can be readily mounted on a truck, amtrac, or tank and is light when not mounted. If you can get enough ammunition and can shoot far enough ahead of your lines, the rockets will be nice to have along. There is no great problem to bringing them in as early as the infantry wants to allocate boat space to supporting weapons.

Another suggestion by Maj Rowse is the use of the LVT(A) as direct support artillery. The writer must take violent issue here. Probably no figures are available, but it would be interesting to know how many actual live targets LVT(A) crews ever saw while waterborne. Of those they saw, chances are they could hit very few, but giving them all the benefit of the doubt,

it is still apparent that most of their rounds hit empty sand and trees. After the LVT(A) gets ashore it is as out of place as Elsie Dinsmore at a stag dinner. It is not a land vehicle; it is not a tank; and it is not an artillery piece. Few LVT(A)'s ever got to the O-1 line as shown on the big operations map. Those that did usually got knocked out pronto. The (A) for armor falls off as soon as the craft pokes its soft underbelly out of the protecting sea. Asking the crew to head for O-1 is asking good marines to commit hari-kari. As an artillery piece, it's a bit difficult to keep the aiming stakes lined up when you have to shift the ungainly monster every time the line of fire moves a few hundred yards right or left. The LVT(A) is obsolescent, if not obsolete, and the sooner we get something else, the better.

One immediate solution is the use of recoilless weapons. These could be mounted temporarily on any type landing craft and removed for antitank, antiemplacement work ashore. These are simply big bazookas, in sizes up to 105mm, with added refinements in laying and sighting. This is a weapon that can go up to the front without drawing down everything the enemy can



A pack howitzer is hauled through the sand dunes during maneuvers at Camp Lejeune, N. C. The pack is mobile. It can be manhandled or towed by either jeep or weasel and can be dug in quicker than either the 105 or 155.

throw at you. A few men can carry and serve it, and a jeep can supply ammunition. The recoilless artillery piece can hit as hard as a tank or SP gun, and it can go places that vehicles cannot go. With further refinements in this type of weapon we can expect the infantry company or even platoon to have tremendous firepower when it lands, all of it just as available as the machine guns or mortars.

We have the atomic bomb to consider in present training, but we must place major emphasis on combating enemy artillery and enemy armor. In World War II armor was the best opponent of armor. Using armor means massing profitable targets, and that is what you must not do in range of powerful enemy artillery. To fight armor and artillery simultaneously, this is one solution:

- 1) Disperse on the beach, using light, portable weapons—that will not draw fire.
- 2) Develop and use powerful antitank artillery of the recoilless, or bazooka, type for use with the infantry.
- 3) Land the supporting artillery early for counter-battery work and utilize naval gunfire and close

air support to the maximum.

- 4) Place observers for the supporting weapons in tanks and carriers as at present, but equip observers on the ground with better optical and infra-red equipment. (The Japs had a foxhole-type BC scope so they could see without being seen.)

☛ SUMMING UP, if the Marine Corps turns toward the armored division organization we'll be depending on sheer power, like a fullback plunging through center. We'll hit hard, but we can expect to be hit hard. The alternative is to copy the "Little Dynamite" type of scat-back. Hit hard, but be elusive. With compact, portable weapons small groups can sift through the beach area using all available concealment. Once the FBHL is reached, cover can be provided as the troops dig in and conceal themselves (better than they did in the Pacific, please).

We've got to plan how to take care of John Rifleman in that first hour, and all the way up to the objective. Shall we land him in a tank, or shall we give him a little dynamite of his own to carry as he wades ashore?

USMC



# Problems of the Landing Attack

By LtCol Robert F. Cushman

THE RECENT WAR TENDED TO CAST THE AMPHIBIOUS OPERATION INTO A FAIRLY RIGID MOLD. THERE IS a danger, therefore, that in developing the landing attack of the future we will become so circumscribed by the elaborate set of rules and details of execution prescribed in the past that our improvements will be step by step in nature and small in significance. It is necessary to stand off and survey the entire field and discover the major steps forward which can be taken. This article proposes to take the preliminary steps of such a survey; namely the delineation of the major problems of amphibious warfare which must be solved. If these major problems are clearly stated, then major and entirely novel means of solution may be developed.

As a forward step, it is necessary to disclaim origination by the author alone of all the ideas to be discussed. They are in reality a synthesis of the thoughts of many forward thinking officers, obtained in bull sessions over most of the post war period. This article is designed simply to bring them together in one place, correlate them, and present them in a form which it is hoped will be informative and interesting, particularly to younger officers who are not in a position to find out what constructive thinking is being done on the future of amphibious warfare.

This much can be said regarding a workable method for the solution of the problems which we will discuss: Once the problems are stated and approved by higher authority they could be called military planning goals. Each goal would then be evaluated in terms of research and development, and in terms of tactics and techniques. The fields of research and development could then be surveyed and existing lines of progress which might lead to solutions would be exploited. New lines of attack which could fill gaps and voids in the program would be initiated. As research and development progress, they might in turn result in new planning goals and almost certainly would show a need for new tactics and techniques. Thus research, development, and tactics would all be interrelated and would themselves be dependent upon a statement of military goals by the operating forces. Let us proceed with the first step in this suggested chain — a proposed listing of the problems.

**The ship to shore movement requires much more adequate protection than it now receives. Proximity fuzes, the possibility of new methods of contamination, and the development and refinement of the armored attack threaten this movement**

### The Ship to Shore Movement

WE HAVE USED the above title to achieve brevity; we really desire to discuss not only the ship to shore movement itself but the events on each end of that movement: means of reaching the objective area, the procurement of intelligence relating to the landing points for the troops, and to some extent the disembarkation of troops from ship to shore conveyances and their deployment for action.

The heart of the problem is the ship to shore conveyance. For years the boat was used. The advent of the amphibious vehicle was hailed as revolutionary, which somewhat overstated the case. There is a tendency today to restrict ourselves merely to improving the vehicles we now have. This is suitable for an interim measure, but a consideration of the entire problem shows that there are three media which might be employed to reach the shore; air, water surface, and underwater. All three must be considered. The principal factors to which these means of ship to shore movement must be related are as follows:

1. *The principal of mass.* An amphibious operation involves, in almost every case, a vast expenditure of time, effort, and naval means and is of great strategic import. It therefore requires that the attacker have a clear margin of overall superiority. It is thus particularly important that the landing attack concentrate its means against the weak point of the enemy.

2. *The principal of surprise.* The movement and concentration of the large forces involved in a major amphibious operation are difficult to conceal. Detection by the enemy may result in counteraction to make his weak point strong, reduce our required overall superiority, and thus deny us the advantage of the employment of mass. To escape detection we must rely upon concealment, speed and mobility.

3. *The principal of security.* The strategic and psychological importance of a major amphibious operation may well place it in the category of a strategic target and subject it to attack by new, strategic weapons. The physical congestion characteristic of the sea areas used by the attack force in past operations would then be suicidal. Yet this very congestion provides, at present, the concentration of forces which enables us to take advantage of the principal of mass.

4. *The principal of coordination.* Since the ship to shore movement constitutes the approach march and initial deployment for battle of the troops involved, it is evident that it must be precisely coordinated and controlled and that the troops must arrive at their landing points in the required tactical formations for the assault and capture of their objectives.

At this point the conveyance problem might be stated thus: there is a requirement for a ship to shore convey-

ance for the landing force which possesses as many as possible of the following characteristics:

1. High speed and maneuverability.
2. Capacity to transport a small tactical unit such as the squad or platoon.
3. Ability to be precisely controlled and coordinated and to move in formations which accommodate larger tactical formations such as battalions and regiments.
4. Easy debarkation of troops.
5. Easily concealed from hostile reconnaissance.
6. Readily transportable by larger transport means.
7. Sufficient range to permit concentration near the desired landing points from widely dispersed transports relatively far out at sea.

The above may be refined somewhat by a consideration of the following logical points. First, concealment is relative. There is no value in concealment of the ship to shore conveyance, by use of submersible craft for example, if the transports and other requisite elements of the attack force cannot be concealed also. Therefore, we must rely upon speed and mobility in this day of long range detecting devices, rather than upon absolute concealment, except for minor raids and incursions. Second, the past has taught the world of the power of the amphibious assault and in the future we shall find fewer and fewer beaches which might be called enemy weak points. We should therefore take a far reaching and daring step: we must avoid beach landings if possible. Third, the distances and intervals necessary for the required dispersion in the future will be of considerable magnitude, of an order which almost precludes the use of waterborne craft. Such craft may be useful as an interim measure, for landing reserve and supply elements of the landing force or for use in conjunction with transports of such speed as to provide for strategic mobility of a high order. Our major conveyance problem can now be stated in this fashion: we require an air conveyance which can carry and debark at least one squad, can move in formation at high speed and land in formation at low speed in varying and difficult terrain, can be transported to the area in larger transports, has an operating radius capable of spanning medium distances, and can be precisely controlled and coordinated. The conveyance should lend itself to mass production, and should be easy to maintain and simple to fly.

In relation to the ship to shore movement the next problem concerns control of that movement. Considering the fact that in a major amphibious operation of the future hundreds of ships and craft must be coordinated and maneuvered simultaneously and in conjunction with the employment of thousands of aircraft, yet all elements must be widely dispersed and out of sight of each other, it is seen that control is a vital function and an important and continuing problem. This



problem is increased a hundredfold under conditions of decreased visibility for then even the individual components of each element cannot see each other. Yet, for purposes of concealment and surprise, we should exploit such conditions and be able to use them as a tool in our hands rather than have to regard them as a hazard or barrier to our operations. Control is essentially a problem of rapid and reliable communications based upon accurate and timely information regarding the ship to shore movement. Taking the latter element first, we may simplify by saying that the high command needs a graphic picture of the entire movement and of each element thereof, and that this picture must instantaneously portray all changes. This graphic picture can provide the information upon which decisions may be based. Decisions once made must be promulgated and disseminated to all pertinent elements of the movement so that necessary action can be taken immediately. Thus the chain of events is information, decision, transmittal of orders, and execution. There is a further requirement for lower echelons. They must know of the actions and movements of higher, lower and adjacent units. They must also be able to communicate laterally as well as vertically within the chain of command in order to amplify the graphic picture, and receive and transmit orders. It is evident that the two functions should be performed in close physical proximity; that is, the means for receiving information of graphic, or pictorial nature, should be adjacent to the means for receiving and transmitting communications of a literal (written or spoken) nature.

• OUR PROBLEM begins to resolve itself into a requirement for a compact, high speed combat information center, or operations and command room. The nomenclature is not important; the functions are. This CIC must provide to the commander and his staff, of whatever echelon is involved, a complete and continually accurate graphical picture of the actions and movements of each subordinate element of his command in the ship to shore movement and a similar picture of adjacent units in the case of other commanders than the highest one. Since the ship to shore movement may be made by air, this picture may have to be three dimensional in order to be pictorially accurate and understandable. As a second function the CIC must furnish a means of instantaneous communication of ideas, in the literal sense, to all affected elements. This includes orders from commanders to subordinates, and information from subordinates to commanders and adjacent units. The system should be a type of "battle circuit" without delays incident to switching and relaying, and should be fitted with selective devices so that the sender may select his addresses, singly or in combination. Messages should be received in a form permitting rapid assimilation; for

example, a teletype tape or screen. The number of circuits must be kept to the minimum and the equipment must be suitable for use by small elements as well as large. In the widely dispersed formations of the future even individual craft must indicate their positions graphically and be able to receive instructions of a literal nature.

• THE SHIP TO SHORE movement requires much more adequate protection than it now receives. Proximity fuses, the possibility of new methods of contamination, and the development and refinement of the armored attack all threaten the safety of the ship to shore movement conducted in the congested, slow moving, unsheltered craft of today. This particular paragraph will discuss the protection of the movement against enemy ordnance, particularly tanks, leaving other factors for later pages. If we can destroy the tank, we can also destroy emplacements of a stationary type and destroy personnel, by using the appropriate type of ammunition. We therefore concentrate upon the tank because it combines the protection of the pillbox with mobility, fire power, and shock power. At present we rely upon the exterior supporting fires of naval aircraft and gunfire to protect the ship to shore movement, both by preliminary bombardment prior to D-Day, by preparatory bombardment just before H-hour, and by close supporting fires during the movement to the shore. Tanks, however, may remain in safe concealed positions and survive the preliminary and preparatory bombardments. The close supporting fires delivered during the ship to shore movement must keep well ahead of the troops, lest the latter be hit by shorts from our own guns and aircraft. Thus there is an extremely important gap in the supporting fires which is critical at the landing point for several minutes prior to the actual "touchdown" and debarkation and deployment of troops. During this interval the troops are helpless to protect themselves, and conversely, hostile tanks may be quickly moved into positions from which they are free of our fires and can "work over" the ship to shore movement. It is evident that as the exterior supporting fires lift, weapons which are organic to the troops and which are accompanying them during the ship to shore movement must be employed to fill the gap. These weapons must have certain characteristics if they are to function properly. First, the weapon must be able to destroy hostile tanks. Second the weapon must be able to participate as an integral part of the ship to shore movement. This requires that it have the same speed, maneuverability and landing characteristics as the conveyances which carry the troops, since it should be able to operate as the first wave of the ship to shore movement and establish a cordon of fire within which the subsequent waves may safely land, disembark and deploy. Since our emphasis is upon air vehicles, it



follows that we require an air antitank gun and that it must be able to fire while in flight and that its flight characteristics must be the same as the troop carrying air vehicles, to include low speed. It is readily seen that these requirements eliminate the conventional attack aircraft for this particular function.

THE TRANSPORT of the future should bear little resemblance to that which we use today. Debarkation by clambering over nets is archaic and outmoded as well as time consuming. For our major amphibious efforts we require a transport which can embark a battalion landing team and can also carry the conveyances needed to move that landing team. When air vehicles come into being the transport must be able to launch them in mass; not necessarily the entire complement at once but substantial elements of it. Successive launchings of individual vehicles would be unsatisfactory. As long as waterborne vehicles are used, the transport should provide means for loading and launching such craft from within the vessel.

In certain cases, where the economics and logistics of the situation permit, or it is demanded by other considerations, a transport which utilizes the air as a medium is required in order to attain the great strategic mobility possible by that means. This opens up an entire new transport field wherein the requirements would be those of long range, high speed, ability to land on the water and discharge troops in their ship to shore conveyances, and a carrying capacity as large as possible within design limitations.

Intelligence, in relation to the ship to shore movement, is necessary in order to reveal the hazards which must be overcome to insure success. It embraces not only the determination of hostile dispositions and defensive works and measures in the landing areas but also the hydrographic, meteorological, and aerological conditions which obtain at the time of the landing as well as the accessibility and trafficability of the chosen landing points.

At the present time imperfect means exist of determining these factors by remote control—that is, other than by sending men in physically to check the facts—but the problem is recognized and its future depends upon developments in various scientific fields. To complete the problem of the ship to shore movement, however, we may say that there is a requirement for quickly and accurately determining, or forecasting, by remotely controlled devices, the following: location of all natural and man made hazards to landing as they pertain to the selected type vehicle to be used in the ship to shore movement (with particular emphasis upon contamination and defensive mining); measurement of the water depth and the contour of the bottom off beaches to be used; height and character of the surf and associated currents; state of the weather and visibility during the

landing period and thereafter.

### Attaining and Maintaining Fire Superiority

THIS PROBLEM is common to all warfare but is of peculiar and special importance in the amphibious attack because during the ship to shore movement the troops themselves are unable to fire for their own protection and must rely upon external means to gain the required fire superiority at the selected landing points, and because for a number of hours after landing and deployment they must continue to rely upon relatively light weapons which they have been able to carry with them in their conveyances. Even after heavy equipment has been brought ashore by those subsequent increments of the attack which follow the initial assault, the attaining and maintenance of fire superiority is a continuing problem rendered more acute than in normal land warfare by the difficulties of amphibious logistics.

Under present conditions, sources of enemy fire are located only in a general and imperfect way and are silenced only by a large expenditure of ammunition. A large number of rounds is used to compensate for the vagueness of detection and location and for the inherent inaccuracies of the weapons systems in use.

The ideal situation would exist if, the moment the enemy fired one shot, the source of that round were instantly and accurately determined, this information were then instantaneously introduced into a fire control system, and one round, which would unerringly find its mark and destroy the hostile target, were then fired by the weapon most suited for the task. Further, during the above sequence of events, our own troops should have maximum protection against the effect of the enemy's one shot.

This problem may be subdivided for more detailed consideration into the problems of: target detection and location; fire control; coordination of fires; weapons systems; and armor. It should be noted that all land armies have requirements in the above fields; our discussion will be limited to those requirements which stem from the amphibious role of the Marine Corps.

Target detection and location are the heart of the problem. The enemy will conceal his weapons with all the artfulness of which he is capable so that location by visual or photographic means will be difficult. Conditions of reduced visibility will have the same effect. Remembering that we are particularly interested in fire superiority during and just after the ship to shore movement we state the requirements for a target detection and location system as follows: (1) The system should be capable of being waterborne and/or airborne; (2) It must detect and locate the target by recording and evaluating the phenomena resulting from both the discharge of the hostile weapon and the trajectory of its projectile, or either of these by itself; (3) It should include multi-

ple means of obtaining location, such as electronic, acoustic, infrared, photographic and any other; (4) it must be able to utilize a number of recording stations simultaneously, airborne, waterborne, and ground; (5) the location of the target must be instantly placed in relation to a reference point which is common to the target, the detection system, and the weapons which will take the target under fire; (6) and finally, this location must be instantly transmitted to the fire control system of the friendly counterbattery weapons, via the fire support coordination center which will designate the weapons which are to be used against the particular target, in terms which the fire control system can readily translate into firing data for the guns.

Coordination of fires is an important link in the counterbattery process. We will not discuss that coordination function which relates to the planning of coordinated fire support since it depends upon the professional excellence, coordination, and judgment of operating personnel as well as on an ever changing tactical situation. We will discuss that function which pertains to the designation of weapons for fire upon targets of opportunity. This decision depends upon the location and character of the target, the availability of the different counterbattery means, and their capabilities and limitations in respect to range, masking by terrain, accuracy, destructive power, and time required to put into action against the target. These are all technical, numerical, or definite physical values. *There is no reason why a decision based upon these factors should be delayed by the necessity for human action.* In conjunction with target locator systems, we see that there is a requirement for a machine which we may call the counterbattery designator. It should receive inputs representing the factors listed above. Its output should be first, the designation of the weapon which is selected to deliver the fires, and second, the selective transmission to the fire control system of that weapon of the location and character of the target in terms which will permit mechanical translation into values for range, azimuth, and fuze setting, and selection of type of ammunition. A further requirement is that the machine be able to accept not only the target location and character inputs generated mechanically by the target locator system but also such inputs generated physically by an operator who receives requests for fires from front line troops or other sources which have located a target but are unable to take it under direct fire with the weapons organic to them or assigned to their direct support.

The mission of any fire control system is to insure that the weapon it controls is properly laid at the moment of discharge so that a hit on the target is obtained. Fire control is thus limited by the inherent accuracy of the piece on the one hand and by the exactness of the location of the target on the other. Within these limits, and

for certain weapons, fire control systems are already highly developed. Our requirement here may thus be stated as follows: Fire control systems must keep pace with increased weapon accuracy and must be able to instantly receive, translate, and transmit to the guns the information they receive from the target locator. The systems as thus developed must be extended for the control of all weapons used in the amphibious operation—not just the larger caliber naval guns, but also the small close-in support craft, conventional support aircraft, airborne guns which are part of the ship to shore movement, and any other weapons systems which may be devised.

In reviewing the problem of weapons we should confine ourselves to those of application to amphibious warfare, and we should state our requirements in terms of entirely new weapons or novel applications of existing ones, not just refinement of present guns. These weapons must be integrated with the new target locators, counterbattery designators, and fire control methods previously discussed. A good example is the requirement for an air antitank gun discussed previously in connection with the ship to shore movement. We are at all times in need of what might be called the universal requirements for weapons which apply to all military forces; namely, increased accuracy, penetrating power and destructive effect, rate of fire, and simplicity of the weapon and its related equipment. For amphibious operations, however, we have requirements which go beyond these. In conjunction with the above, we also require that the weapons be light in weight, small in caliber; all without sacrifice of penetrating power. Thus our general amphibious requirement is for hard hitting weapons of medium range which can be employed from air vehicles with slow speed flight characteristics; from small, shallow-draft, close-in support craft; and from amphibious gun carriages. This calls for new weapons, based upon new principles; the present practice of attempting to mate a conventional ground weapon with a carriage which was designed for some other purpose is a shotgun wedding. New weapons and new carriages, both designed for amphibious operations, are the basic requirement for the future in this field.

Fire superiority is achieved when one contender has a net balance of *effective* fire over the other. This is best attained by one force delivering a greater volume of rapid, accurate fire than the other. However, it can be assisted if the effectiveness of the enemy's fire is reduced or nullified by passive action in conjunction with our own counterfire. This introduces the subject of armor. We need armor, of the proper types, to protect troop conveyances, major weapons, assault troops, logistic installations, and personnel required to work continuously. Since the trend in the future is to high speed and mobility, it is evident that the heavy armor plate



of the present will not be satisfactory. Our primary problem, thus, is to find light weight armor. Such armor might then be fashioned to meet the following requirements: (1) Protect antitank weapons from tank fire. (2) Protect troop conveyances of whatever type used against small arms, antiaircraft fire, and VT fuse or airburst TOT's. (3) Protect the vital and most vulnerable portions of the body of all assault troops and essential logistic personnel against fragments. (4) Provide a shield for the principal crew served weapons which will give them protection against air bursts, and small arms. (5) Provide a light portable shelter for shore party and other working personnel in exposed positions.

### **The Security of the Beachhead**

☛ BECAUSE of the strategic implications of successful amphibious attack, the enemy may be expected to react with great violence and speed. The landing force, hampered by the weight carrying limitations of its conveyances in the initial stages of the ship to shore movement, is for a number of hours after landing deficient in heavy weapons and mobile equipment. This tends to

**Because of the strategic implications of successful amphibious attack, the enemy may be expected to react with great violence and speed. The landing force is for a number of hours after landing deficient of heavy weapons and mobile equipment. The security of the landing force is vital**

make the landing force vulnerable to armored attack in particular and sensitive to counterattack of any kind, particularly on the flanks. Thus security of the landing force against counterattack, particularly during the first phase of the operation, is vital.

The security of the beachhead is intimately related to certain of the problems previously discussed; particularly the protection of the ship to shore movement and the attainment and maintenance of fire superiority. Since many of these requirements apply directly they will merely be referred to in this discussion.

Once again the major problem may be subdivided. *Security of the beachhead is dependent upon early detection of hostile forces, a warning system, active defensive measures, passive defensive measures, and the coordination of all into an integrated plan for defeat of the counterattack and resumption of the offensive.*

The movement of enemy forces during daylight under the eyes of reconnaissance aircraft is difficult. Therefore, while improvement in daylight detection by the better models of television, aerial photography and other devices should be exploited, it is the detection of the enemy at night or during other conditions of reduced visibility with which we must concern ourselves primarily. Here we see that our problem is closely related to that of detection of hostile targets, taken up under

the subject of fire superiority. In this case, however, we must add some requirements since our target will be mobile and of a different nature; i.e., it will normally be moving and it will not be firing at the time we wish to locate it. The fact that we do not have the phenomena of weapon discharges and trajectories complicates the problem, on the other hand it may be simplified because a moving target may permit so called passive detection (no transmission needed, only a receiver) and because normally any moving target is easier to detect than one hidden and immobile. Our added requirements in this case are these: we need a target locator which can be used from the air or ground to detect, locate, and track moving targets such as vehicles and tanks. This locator must be able to translate and transmit this information, not only to the counterfire weapons control systems, but also to a warning system which can alert the entire command.

The moment enemy forces are detected all members of the landing force, and the principal elements of the Attack Force, must be alerted so that active and passive defensive measures may be put into effect. This requires

that information from the target locator and all other reconnaissance agencies be collected, collated, and then transmitted to all elements of the command, preferably in the form of a sound signal of prescribed meaning. Such a system has been developed to a rather high state for defense against aircraft; but against ground attack the system is slow and uncertain. This is due in part to the fact that accurate and definite reports on enemy troop movements are difficult to obtain and are usually very difficult to filter from the many vague, inaccurate, and confusing reports that reach the central intelligence agency. Further delay is entailed in transmitting the information since in many cases it requires that orders accompany it, or that a higher commander reach some pertinent decision regarding the affair. This slow moving method may serve against a moving column of foot troops, but it is imperative that we entirely revise the system to cope with the armored or motorized attack. We must equal, at the very least, the present efficiency of the warning system used in air raids.

Presuming that our target locators can give us accurate information, transmitted automatically back to headquarters, we then have a requirement for an agency which can rapidly filter and evaluate such reports and flash the warning condition required. At the present time such evaluation requires the use of human judg-



ment almost exclusively; this must be obviated by a complete tactical doctrine of antimechanized defense, to include prearranged plans of counteraction. Very little human judgment, with its attendant delays, is required at present to receive a radar warning and track of enemy planes, vector defending aircraft against the raiders, and control the fire of antiaircraft weapons. More of this in later paragraphs; here let us say this agency for evaluating reports on enemy armored movements and alerting and directing counteraction must be as automatic as possible—certainly to a degree far beyond that of today. This agency will likewise be required to maintain a graphical picture of the continuing movement of the enemy and also the movements and positions of the defender as he executes the prearranged plans required. A further requirement is the transmittal of this complete picture to the counterattacking force accompanied by the transmission of literal instructions until such time as contact is made with the enemy and control of the action can be taken by the local commander. A final requirement is that the moment the report of attack by the enemy is verified, instantaneously a sound signal should be triggered by automatic means in all elements of the command. This signal must not be dependent upon any "passing of the word" by sentries or relay by phone, or even flash radio—it should be done automatically by one impulse from the central filtering agency which will activate all receivers throughout the command.

While it must always be clearly understood that the best defense lies in the aggressive conduct of active defensive measure, there is still a requirement for passive defensive measure which may assist the active defense or which may protect those individuals and installations which are not required to participate in the active defense. The requirement for protection here is the same as that detailed in the discussion of fire superiority. Measures which may assist the active defense are principally of an engineering nature and many of them are already developed to a considerable degree. The requirement here is for their complete integration into the active defense and for improvements in the tactics, technique and speed of their use. First we must perfect our methods and rapidity of using the mines, smoke, etc., that we have on hand for combatting tanks in a passive way; then it will be worthwhile to set forth ordnance specifications for new devices which may be employed within the procedural framework developed for existing devices. At present we have no overall system or even doctrine for the employment and coordination of a passive defense plan involving rapid laying of mines, use of smoke, use of obstacles and barricades; all integrated with the active system of fires and counter attack. Therefore our first requirement is to solve the above.

A similar need exists in the field of active antitank

defense. We simply have not put enough thought on the subject so that we can come up instantly with the best plan for fighting tanks with all weapons at our command, to include artillery, naval gunfire, aircraft, antitank guns, and infantry-engineer-tank counterattacking forces. Our requirement, and a pressing one, is for an overall, effective antitank doctrine which will apply to any force of combined arms. Once the doctrine is conceived it must be tested and rehearsed in the field. When firm, we may then state requirements for new weapons and devices which can improve the efficiency, speed and effectiveness of our antitank system of defense. Of course, the standard requirements for weapons which are listed in the paragraphs on attaining fire superiority will hold in this field also.

### Logistics

✱ EVEN THOUGH many of our tactical problems are brought to a solution, the effort will be wasted unless progress in logistical support can keep pace. It will be of little value to devise new weapons and new "tactics of dispersion" if we cannot keep the gun crews supplied with ammunition, feed the troops, and move them with the speed required. Perhaps the major problems in the field of logistics are related to the saving of man hours of labor—by saving both the man and the hours. The length of time required to get supplies to the using troops across the barriers of water, beach and difficult terrain and the large numbers of men employed in supply echelons must both be decreased. The same is true, of course, in relation to the obverse face of the logistical picture—evacuation and salvage. In reaching a solution to the problem of logistics it is probable that emphasis should be on a far reaching development program, well coordinated and embracing hundreds of items, rather than a broad research program or a school conducted study, although each of the latter will have its place also. *A primary requirement is thus the formulation of an integrated Marine Corps development program embracing all those items and stating the requirements for each.* In stating the requirements upon which such a program might be based we will break the major problems into four more easily handled problems: Equipment and materiel; transport to the objective area; unloading and movement to the using troops; and salvage and evacuation.

1. *Equipment and materiel.* The overall problem in this field is the design of equipment and materiel specifically for amphibious military requirements. While it is undeniable that certain major savings accrue when standard commercial and industrial items are utilized, it has been found in global warfare that this may often be false economy. Very often there is no commercial need for specific items of equipment needed by the Amphibious forces, or else the industrial item is sufficiently

different from the optimum military specifications as to require significant compromises to be made in regard to efficiency from a Marine Corps standpoint. Major items of materiel and equipment, therefore, should be designed to meet our amphibious military specifications. This is a vast job in itself and represents the foremost problem in this field at present; the establishment of amphibious military specifications for the multitude of items used and the development of each to at least pilot model stage. The final design of each item must satisfy our rigorous standards for light weight, ruggedness, dependability, waterproofing, ease of maintenance and operation, simplicity of packaging, psychological acceptability where pertinent, adaptability to means of transport and to methods and machines for unloading and delivering, and delivery to the services in the numbers required. Note that in many instances these standards will differ for amphibious operations.

2. *Transport to the objective area.* This requirement may be simply stated as being the problem of adapting all items to transport over long distances by air or water. It will require development of mechanical means of loading and unloading as well as methods of tiedown and stowage.

3. *Unloading and movement to the using troops.* This problem is the one which involves the greatest use of manpower and the maximum amount of rehandling. The ideal would be if an item of equipment were unloaded mechanically into a conveyance which could transport it directly to the consumer, the using marine, wherever in the battle he might be. Timely delivery is also a requisite; the materiel must be delivered to the user when he needs it. This ideal is impossible of attainment because dumps must be interposed between the transport and the user, in order to have a reserve which will cushion the effect of enemy action tending to interrupt the supply chain, in order to store the surplus of items which can be landed in excess of immediate requirements, and to provide echelonment in depth and dispersal of supplies. Nevertheless, the field is wide open for improvement in the amount of rehandling, loading, and unloading which must be done and the number of men which are required to perform these functions. The primary requisite is that the beach, or other terrain between the transport and the selected dumps, be crossed by the supplies without handling. The only handling required should be that demanded by the tactical and logistical situation.

4. *Evacuation and Salvage.* The problem here is the reverse of the one stated in paragraph three above. Casualties, both personnel and materiel, must be evacuated with a minimum of rehandling and expenditure of manpower from the forward areas to the rear collecting points or hospitals. Medical science, of course, has continuing requirements for improved care of sick and

wounded, which the author does not presume to state.

### Security of the Attack Force

☛ WHILE THIS REQUIREMENT is not the responsibility of the Landing Force, it is of immediate concern since the measures taken will effect the tactics and techniques used by the Marines. Many of the problems which were examined in relation to attaining fire superiority and to security of the beachhead are applicable to the larger overall problem of security of the attack force as a whole. In stating the problem, once again we may break down the overall requirement into two subsidiary ones; passive defensive measures and active defensive measures. Neither one may be examined fully because of security restrictions but the principal implications which affect the Landing Force may be indicated.

1. *Passive defensive measures.* These will undoubtedly affect the Landing Force to the greatest degree because the principal defensive measure in this category will be that of dispersion to greater and greater distances between all elements of the Attack Force and within each element. This requirement will thus aggravate the following problems of the Landing Force; control and timing of the ship to shore movement; dissemination of orders to widely scattered subordinate echelons; control, spotting, and delivery of supporting fires by naval gunfire vessels and aircraft; and protection of the Landing Force against the effects of newly developed weapons, particularly during the ship to shore movement, in conjunction with those measures used by the Attack Force as a whole. The problems we have outlined in preceding pages must be reviewed, therefore, in the light of these conditions.

2. *Active defensive measures.* The problem for the Landing Force here will be to see that those measures taken by the Attack Force give adequate protection to the Landing Force, particularly during its most vulnerable phases, and that measures which may be taken by the Landing Force, especially after establishment ashore, are fully coordinated with the active defense plan of the entire Attack Force.

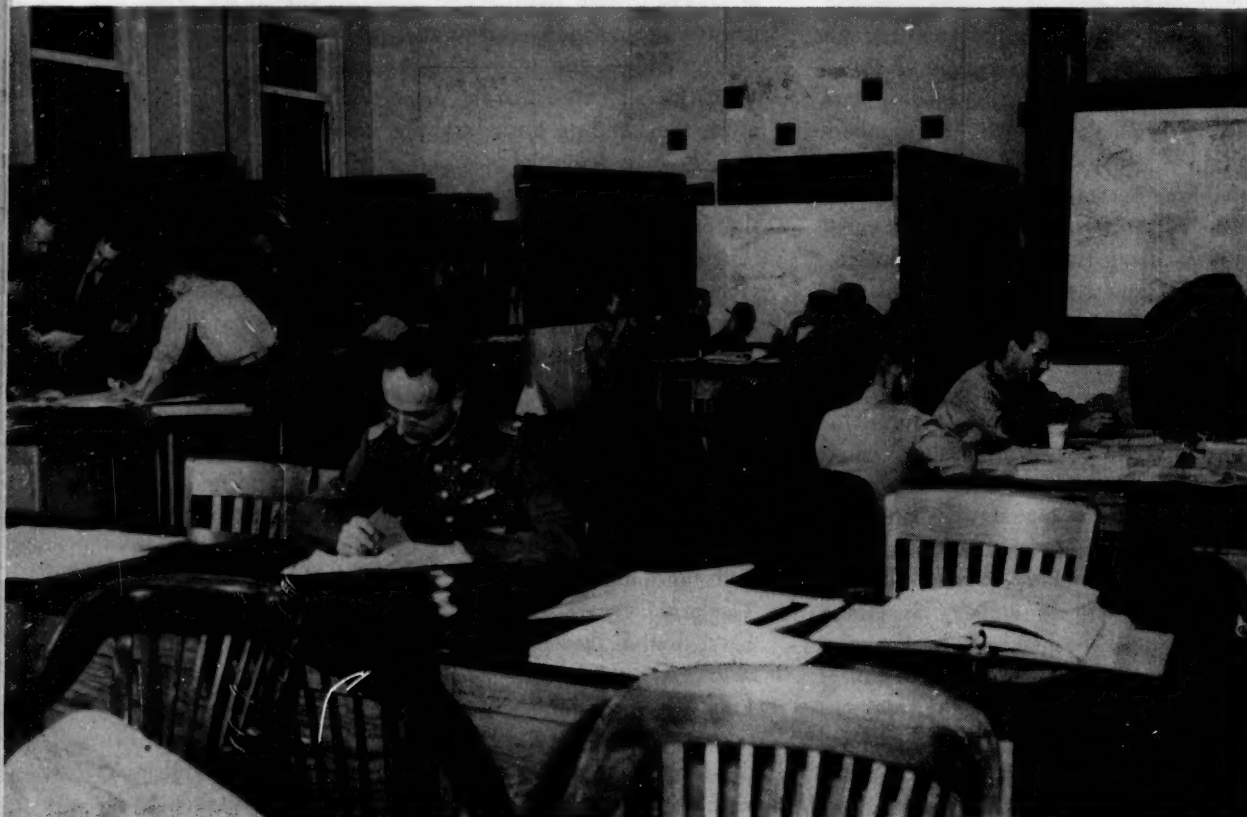
### Conclusion

☛ ALL OF THE PRECEDING PARAGRAPHS aim for the same goal; to present a tentative statement of those requirements whose solutions are most urgent if we are to take big steps forward in our development of the art of amphibious warfare. It is important to note that before any solutions can be found to problems such as these, which a moment's thought reveals are important to our future progress, the problems must be stated in military form. Official and specific requirements must be set up in the *form of a Marine Corps program*. Only then can scientists, engineers, developers, and designers clearly set their sights and put forth productive work toward fulfilling the needs of the Marine Corps. USMC



# Leavenworth and the Marine Corps

The elite finishing school of the U. S. Army is dedicated to the proposition dear to the heart of all Marines: that wars are ultimately won by fighting on land. The school is devoted to the revising and improving of the art of modern warfare



The Army College at historic Ft Leavenworth attracts students from all services and many nations.

THE MILITARILY FAMOUS COMMAND AND GENERAL Staff College at Ft Leavenworth, Kansas has been aptly described as a school for generals—Marine generals as well as Army. Just as capable Army men have always vied to make the Leavenworth list, the marines who have taken the Leavenworth course have been carefully picked officers destined to hold down many important billets in the Corps.

Marine Corps interest in Leavenworth, however, is not confined to Leathernecks aspiring to stars or to

those on the road to top staff assignments. The affinity between Leavenworth and the Marine Corps has a more basic foundation. For the Army's General Staff College is dedicated to the proposition dear to the heart of all marines, that wars are ultimately won by fighting on land, and the center of military thinking concerned with revising and improving the doctrines of modern land warfare is Leavenworth. The Marines, whose primary mission is to conduct a special type of surface battle, have frequently drawn inspiration in the past from the concepts developed at Leavenworth. And, as the trend of warfare moves the services closer together, one does not need to be a prophet to predict that the valuable exchange of ideas between Leavenworth and the Marine

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**By LtCol William R. Kintner, USA**

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Corps will increase in the future.

What this amounts to is that the Army and the Marine Corps are partners, not competitors, in developing the art of ground combat. No marine, however, would ever dream of going into a business with an unknown partner. A marine would first want to know how the prospective partner thinks and how he conducts his affairs. And if a marine wants to peer beneath the skull of the Army mind he can find no better place to conduct his investigation than at Ft Leavenworth. As a matter of record, marines have been carrying on this investigation for many years. But how does a marine go about going to Leavenworth today, what does he do during a ten months' stay at this top Army school, and what does he learn of value to himself and to the Corps?

To answer these questions the following short Baedeker on the Command and General Staff College is presented in the form of a Leavenworth scenario.

### Scene One

**Special Situation.** You are a member of a special board of officers appointed by the Commandant, USMC, to select marines for assignment as students to certain service schools, including the Command and General Staff College. It is your task to establish selection standards for these assignments. General standards established by the Department of the Army require that Army students at Leavenworth be between 30 and 40 years of age and have a minimum of seven years service.

**First Requirement.** Establish standards for detailing six Marine Corps officers as students to the Command and General Staff College for the year 1949-1950.

**A Solution to the First Requirement.** Marines will be selected to attend Leavenworth on the basis of their age, years of service, combat record, and general fitness report. The service background of the Marine officers who have attended Leavenworth since VJ Day will be used as a guide in detailing marines to the Command and General Staff College. In general, the average length of service of marines attending the post-war regular courses at Leavenworth has been 13.7 years. Their World War II services has included command of infantry and artillery battalions, division and corps staff service, and defense battalion experience. They all have had a general fitness rating of outstanding.

Individual applications for detail as a student to the Command and General Staff College will not be considered in making selections. Orders covering officers nominated to attend this course will be issued during the early spring, 1949.

### Scene Two

**Special Situation.** You are a Lieutenant Colonel, United States Marine Corps. You are a member of the Navy Section, Command and General Staff College. You have



**Headquarters building.** Marine officers sent here are destined to hold down many important billets.

just received a letter from LtCol Gravel advising you that he has been assigned to Ft Leavenworth as a student. Gravel wants to find out all the information about the post that he can before he packs up the wife, kids and dog and drives from La Jolla, California to the banks of the Missouri River.

**Second Requirement.** Give Gravel the lowdown.

**A Solution to the Second Requirement.**

Dear Gravel;

Congratulations on your assignment. You have a very pleasant year to look forward to.

The first thing you want to know about is quarters. You will be happy to know that the situation is well in hand. This year every student, including foreign students, had quarters on the post and I see no reason why things should be different next year. Quarters are assigned on a rank basis, with additional consideration given to officers having several children. You are relatively senior so you shouldn't be hurt. The quarters are not fancy, but all of them are comfortable and some of them are spacious. Essential furniture is furnished as far as possible by the Quartermaster. This generally means a dining-room set, refrigerator, stove, sideboard, chairs, miscellaneous tables and all the army bunks you want. Servants are available at reasonable rates.

All normal post services, including laundry and dry cleaning, are provided. The PX is well stocked. A good commissary sales store is in operation. The post theater is modern and has early runs of the better shows.

The Officers Club is quite attractive and is set in the midst of an excellent golf course. Facilities are also available for badminton, bowling, gymnastics, handball,

marksmanship, skeet, softball, squash, swimming, and tennis. Plenty of varied activity is arranged by and for the ladies of the post.

Schools are operated on the post for kindergarten, nursery and grades one to eight. Public high schools and parochial schools are available in the city of Leavenworth. Post bus service is furnished for children attending these schools.

Kansas City is only 35 miles away and can be reached easily by bus as well as private auto. From Sherman Air Field, which is on the reservation, flights can be set up to any place in the United States without much trouble.

You will soon receive from the college printed material to aid you in preparing yourself to come here. If you have been away from studies for any length of time, you will find a review of the scholastic material particularly helpful. I might add that map reading and military inventory tests are likely to be given you at the beginning of the school year. The College opens on the first of September and if you can get here at least ten days earlier you will have adequate time to get settled.

Except for the fact that the beginning and end of the school year get pretty hot, there is no serious complaint to make about the weather.

With best wishes,  
S/LtCol Beach, USMC

### Scene Three

**Special Situation Continued.** You are a staff assistant to the Commandant, Command and General Staff College. You specialize in ghost writing.

**Third Requirement.** Draft a brief set of notes to be used by the Assistant Commandant on 1 September 1949 in orienting new students to the mission of the College, the current curriculum and the general method of instruction.

#### A Solution to Third Requirement.

Introductory remarks. . . .

The mission of the College is to conduct research and establish doctrine for all phases of land warfare. The College instruction aims to prepare officers for duty as commanders and general staff officers of divisions, corps, armies and comparable levels in the communication zone. In addition, it seeks to prepare each officer for duty in either the personnel, intelligence, operations, or logistics division of the General Staff at theater or Department of the Army levels.

The course at Leavenworth runs ten months and is divided into six phases, the first being a short orientation phase which opens today. Phase II, the longest phase, covers the combat operations of infantry, airborne and armored divisions, corps and armies. It is during this

phase that the entire class takes two valuable trips, the first to San Diego for a week of instruction in amphibious instruction conducted by the Marine Corps and the Navy, and the second to Eglin Field, Florida and Ft Benning, Georgia where the students observe, in turn, tactical air, parachute landings and infantry demonstrations. Phase III covers the organization and functioning of the Communications Zone, especially one set up to support a sustained land operation. Phase IV, a comparatively short phase, is concerned with the Department of the Army and the organization of Zone of Interior. Phase V provides specialized instruction in top-level personnel, intelligence, training, operation and logistics procedures and problems.

The course culminates in Phase VI—ten days devoted to consideration of the trends in future warfare. This instruction involves the planning and conduct of a joint land, sea and air operation to seize an overseas base. All of the services will have a hand in the presentation of this problem. For example, the introduction will be handled by a Marine Corps Schools team.

As the Command and General Staff College is the school for training division and higher unit commanders and their staffs, instruction is always presented from the viewpoint of the commander. The concept of the General Staff consistently presented is that of an agency whose sole purpose and function is to assist the commander.

Most instruction at the College is geared to integrated map exercises which are designed to illustrate the responsibilities of the commander and the duties of his staff. The student is made to live the part of the commander and the duties of his staff. The student is made to live the part of the commander or a general staff officer in a variety of circumstances. In every situation the student is required to make the decisions of the commander or prepare the studies, estimates, plans, operations orders, etc., that might involve upon a general staff officer in identical circumstances.

In solving problems the student is required to live in the present. He must always solve the requirements just as if he were in the shoes of the commander or staff officer. This device is essential to the achievement of the mission of Leavenworth—to train commanders and staff officers. Since decisive thinking and clarity of expression only come from practice, the division of the class into small sections—35 to 40 officers per group—permits each student to gain the practice he needs to develop confidence and mastery of expression.

Although map exercises are the most frequently utilized vehicle of instruction they are supplemented from time to time by conferences, terrain exercises, and map maneuvers. The course is high-lighted frequently by lectures given by resident faculty members and distinguished guest speakers, civilian and military.



Students are examined by formal graded map exercises, which are announced in the schedule and by spot requirements given in class without advance warning. The student ordinarily spends six hours a day, five days a week in class and is expected to spend four hours a day outside of class in study or other preparation.

An unusual feature of Leavenworth today is that of the approximately 450 students assigned to the Command and General Staff College, 50 are foreign students representing some 26 different countries. The chance presented to American officers of exchanging professional knowledge and developing friendships with outstanding officers from other countries is one of the most important opportunities made possible at Leavenworth.

Concluding remarks. . . .

#### Scene Four

**Special Situation Continued.** You are a Marine officer, a member of the Class of 1949 Command and General Staff College. It is 15 May 1949. Before you is a letter from your friend Gravel who, as you know, is due to come to Leavenworth in August. Gravel wants you to tell him just what value Leavenworth has been to you.

**Fourth Requirement.** Answer Gravel's plea.

20 May 1949

Dear Gravel;

It was good to hear from you again. I'm delighted to know that you are on the Leavenworth list. I am not in the least surprised to learn that you feel both a little apprehensive as well as happy about coming to school here. To be perfectly frank with you I felt pretty much the same way last year, for after all, Kansas is a long way from salt water and Leavenworth is the Army.

Yet, now that my tour is almost over, it seems to me that most of my fears vanished as soon as I reported. It didn't take me long to discover that the Army and Marines have a great deal in common. This makes just as good a starting point as any to attempt to answer your question, What do I think is the main value of Leavenworth to a Marine officer?

While the Marines will always give top priority to the job of getting across a hostile beach, it's just a personal guess of mine that if another war comes, Marines will find themselves participating in sustained offensives far beyond the landing area. Why do I say this? Because the next war may not involve as much of the island-seizing strategy that was so vital to the Pacific campaigns. Consequently, there may be fewer amphibious landings to make. If there's anything to this hunch of mine you can bet your last dollar that Marines won't be sitting around waiting for something to come up while there's a war going on elsewhere. It's more than likely that the Army and the Marines will often

join forces to go after strategic real estate. If this makes sense it will certainly pay a Marine officer to know as much as possible about how Army divisions, corps, armies and army groups function in a major land campaign. Leavenworth teaches just that.

Naturally, the Army doesn't specialize in amphibious warfare, and the time Leavenworth devotes to it is just a fraction of what you had at Quantico. But the Army conducted a lot of landings in the last war and may team up with us to assault somebody's shores in the future. The fact that they go about the amphibious problem a little different than we do makes Leavenworth a good place to exchange helpful ideas.

There's a lot being said these days about airborne operations, on which Leavenworth runs map exercises of all types and sizes up to the airborne army. Marines are naturally interested in this the airborne game. The problem, I've learned, is a complicated one, and I think I've gotten a more realistic appreciation of airborne capabilities than before I came here.

The specialized instruction phase in which we are now involved has already given every Marine student a better insight into the relation between military and national policy. Most of us in the Marine group are getting our first real appreciation of overall national man-power policies, procurement problems, civil defense organization, etc. This specialized phase is making it easier for us to understand the total job all the armed forces have to do.

You will be interested to know that several additional marines are now taking the intelligence and logistic sections of the specialized phase of the course. As I recall, most of them came from corresponding staff billets with either the Atlantic or Pacific Fleet Marine Forces or from the active divisions. They are here on temporary duty and will return to their assignment when the course is over. This looks like another good step to me.

You didn't have to read this far, Gravel, to see that I believe the schooling we're getting here at Leavenworth is worthwhile. It's bound to pay dividends to the Corps as a whole. From what I have been able to discover I don't think this year is going to hurt my career one bit. But enough of this. I've got studying to do.

We're going to take you up on that visit to Pendleton in July, so I'll save the lowdown on Kansas City 'til then.

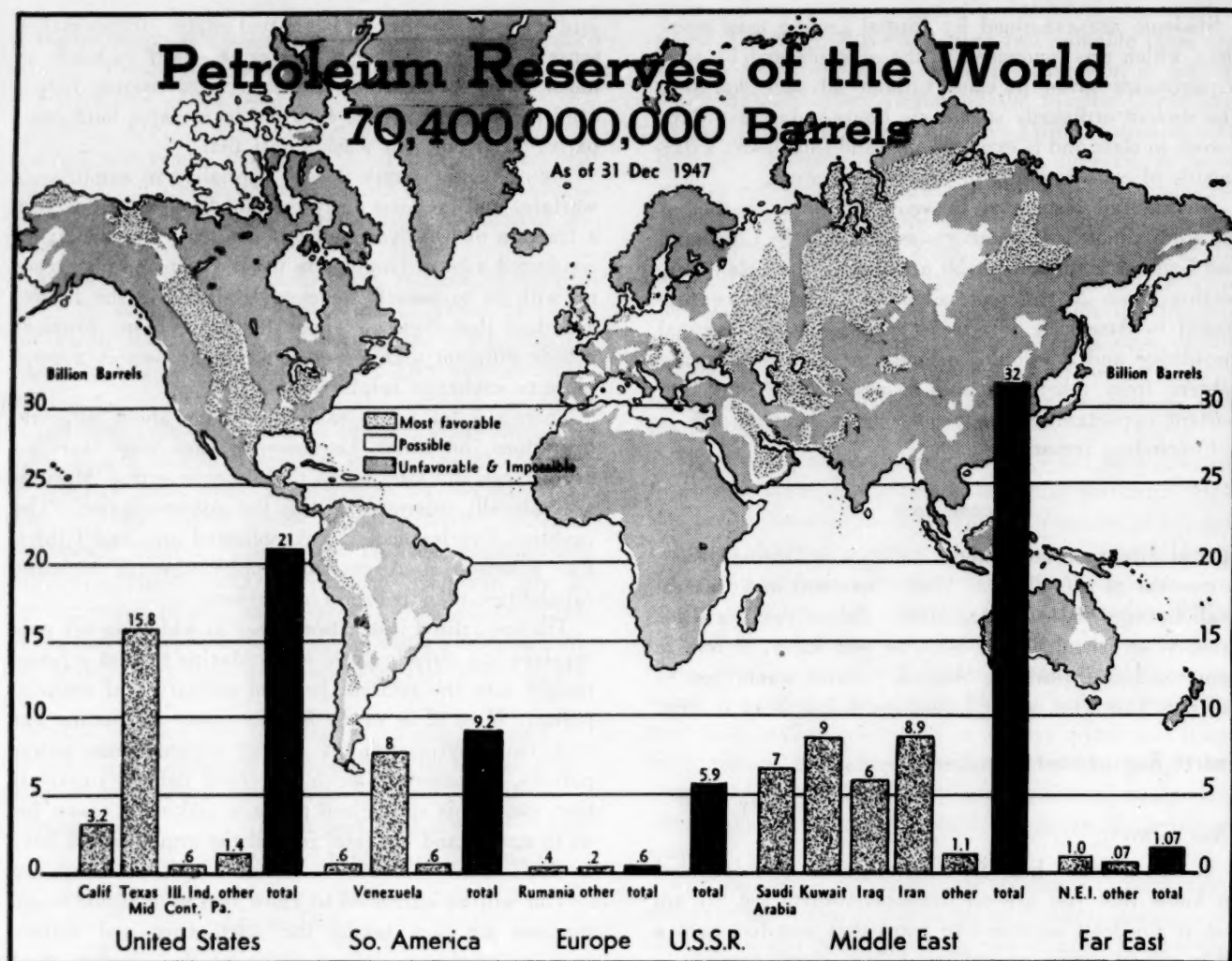
With best wishes

S/Jim

On this happy note the Leavenworth Baedaker ends. On the basis of your past performance reservations for the 1949-50 season will soon be made by Marine Corps Headquarters. If you want to go to Leavenworth and are not eligible now, the record you make today will be your application to attend the Command and General Staff College tomorrow.

USMC





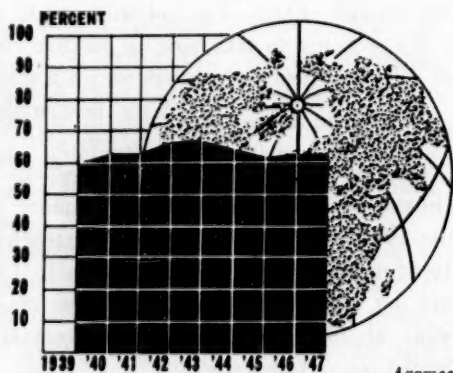
Aramco

# The Oil Snarl

By Col Joseph H. Berry

## PART II

**THE U.S. HAS CONSISTENTLY SUPPLIED BETWEEN 60 & 70 PERCENT OF THE WORLD'S OIL NEEDS.**



Aramco

THE STRATEGIC ASPECTS OF ANY MATERIAL CAN BE measured by a nation in its relation to national security by the simple means of determining whether or not there is a sufficient amount of the material to satisfy the nation's war needs. In World War I petroleum products were not strategic as far as this country was concerned. However, with the rapid development of means to use the products refined from petroleum, and the great demands which World War II placed on petroleum products, oil in all of its aspects became a strategic material. There was not enough oil produced in this country during the war to meet the demands placed on it by the war and therefore it was a strategic material. Since the end of the war the use of oil and oil products has increased so much that it is necessary for us to examine the oil situation from its strategic standpoint; i.e., do we have

## Part II: Any material whose scarcity affects national security is strategically important. There is not enough oil produced in the United States to meet the potential demands and this places petroleum products in the critical category

enough to oil another war? Before this question can be answered definitely certain questions must be answered. However, it is impossible to answer all of them, with any degree of certainty, so we must make the best of the situation. Questions fundamental to this sort of evaluation are: *When* will the war begin, *where* will it be fought, *who* will fight, *how* and with what weapons will it be fought and *why* will it be fought.

The "when" can be simply answered by saying that we will consider that the war will be fought now, with all that that timing implies. "Where" can be answered, sufficient accuracy for this discussion, by saying that it will be fought at some place away from the United States. This is in keeping with the strategic concepts which this country has held for a good many years, and, judging from the effects of the past war on the battle zones, it will be to our advantage to keep the war away from us. Further, keeping the war away from us will complicate the oil situation, so by accepting this answer we are adding to our burden. "Who" will fight is, of course purely academic at this stage of the game. "How" it will be fought brings up a very controversial point of view. This matter of the conduct of a war is a thing of deep concern to all of us in the military service and *should be* to all of the civilian population of the United States. The how of fighting a war can be *the* vital issue in its conduct. IF that conduct does not pan out national security is lost. We have but to recall the "Maginot" complex of the French with its attendant results to bring this point home. Roughly, this divergence of opinion can be summed up into two ideas: a long war vs a short war. Again, picking the worst situation from the petroleum standpoint we must perforce accept the long war thesis. The "why" of a war is so closely connected with the "who" that nothing more need be said here concerning it.

In order, then, to discuss the strategic aspects of petroleum we may consider that we are going to fight a war now, outside the continental limits of the United States and that it will be a long war.

☛ AS WAS INDICATED earlier, the demands for petroleum products in the United States today is on the order of 5.5 to 6 million barrels per day. The civilian demand is composed of a number of types of users: fuel oil for heating homes, gasoline for passenger cars and trucks, diesel oil for locomotives, trucks and busses, black oil for,

various types of commercial energy production, and aviation gasoline for commercial aviation. Much of this demand has grown up since the end of the war, as is indicated by the 50 per cent increase of consumption of oil products between 1945 and 1948. This rise of civilian demand is good from one standpoint; that of causing an increase in the refinery capacity of the country. However, if the civilian demand is allowed to continue at the present rate it will soon be such that it will cripple this nation economically if that supply is cut off. The cut off can come from either a lack of supply of oil in this country or reaching this country, or from a demand made upon the available supply by the armed forces in time of war. It should be recalled again that this country entered World War II with an excess of about one million barrels per day of refinery capacity. We do not have this excess now nor will we have it if the demand continues to approach or exceed the refined supply. Furthermore, under a democratic form of government and with free enterprise we can do nothing but let the demand go up.

☛ WE ARE THEREFORE permitting a condition to be established in this nation which by its very nature emphasizes the strategic nature of petroleum. Our economy is based on the idea of a large number of workers concentrated in a large factory turning out a specialized product. Examples of this come readily to mind; the Ford plant in Detroit, the Kaiser shipyard in Portland, Oregon, the Westinghouse plant in Pittsburgh. This type of concentration means that homes for these workers must be located close by, or failing that, within commuting distance. Commuting distance can be anything up to an hour or an hour and a half by automobile. Consider the consequences to an important factory if the workers of that factory cannot get gasoline to drive their cars to and from work. It simply means: no gasoline, no workers. Alternate means of transportation are not the answer. In a country where there is one car to every four or five persons, persons acclimated to using private transportation, there is not being a transportation system capable of assuming the added burden of transporting those people whose cars are "dry-docked" by lack of gasoline. The only solution seems to be to provide them with a minimum amount of gasoline. The same thing may be said of the house heating situation. The numbers of conversions to oil and the installations of new burners





Socony Vacuum

**Tanker *Tatarrax* unloads at oil terminal, Staten Island, N. Y. Tankers are most important means of bulk shipment of oil. *Tatarrax* is 9,890 tons, has capacity of 132,600 42-gallon barrels.**

for oil has been phenomenal in this country since the war. Oil is relatively inexpensive, reliable, clean and of the utmost in simplicity in use; given a few more years and the young married man will not know what a coal shovel looks like. Every conversion or new installation adds just that much to the demands upon our supply. We must, therefore, provide for a certain minimum of heating for the increasing numbers of units in dwellings. Factories depend on some form of energy to run their machines. This usually takes the form of electrical energy, either purchased as such or manufactured by the conversion of some other form of energy to electricity. The number of factories converting to oil for energy is on the increase. These factories will be the producers of our implements of war, even though today they may be producing toasters, ice cream freezers or typewriters (this may not be a very apt example, some think typewriters are implements of war). We cannot reduce the oil requirements of these factories, on the contrary, in

a wartime economy they will require additional supplies to implement the war. We must therefore provide for these factories and their demands on our supply of oil. And in addition, in all probability, we will have to provide oil for additional factories.

It all sums up to the inescapable conclusion that oil has made such an inroad into our economy that we will not be able to get along without it. This does not mean that we may not some day *have* to get along without it, but when that time comes it will not be in a war, it will be an evolutionary process. We are discussing the present.

✿ IN WARTIME we can do what we cannot do in peace. Controls are an anathema to freedom-loving people and in peacetime are difficult to impose. But, in the event of another war, controls, in my opinion, will be required. They may take much the same shape as those of World War II with rationing a favored means of democratically



spreading the supply equitably. However, the savings to be made through rationing will not be sufficient to meet the demands which the military will impose. On the present basis of consumption of about 5.5 million barrels per day it is doubtful if rationing will do more than hold civilian consumption to that figure. If we superimpose on that figure World War II's peak requirements of 1.5 million barrels per day we find that we have a requirement of 7 million barrels per day!

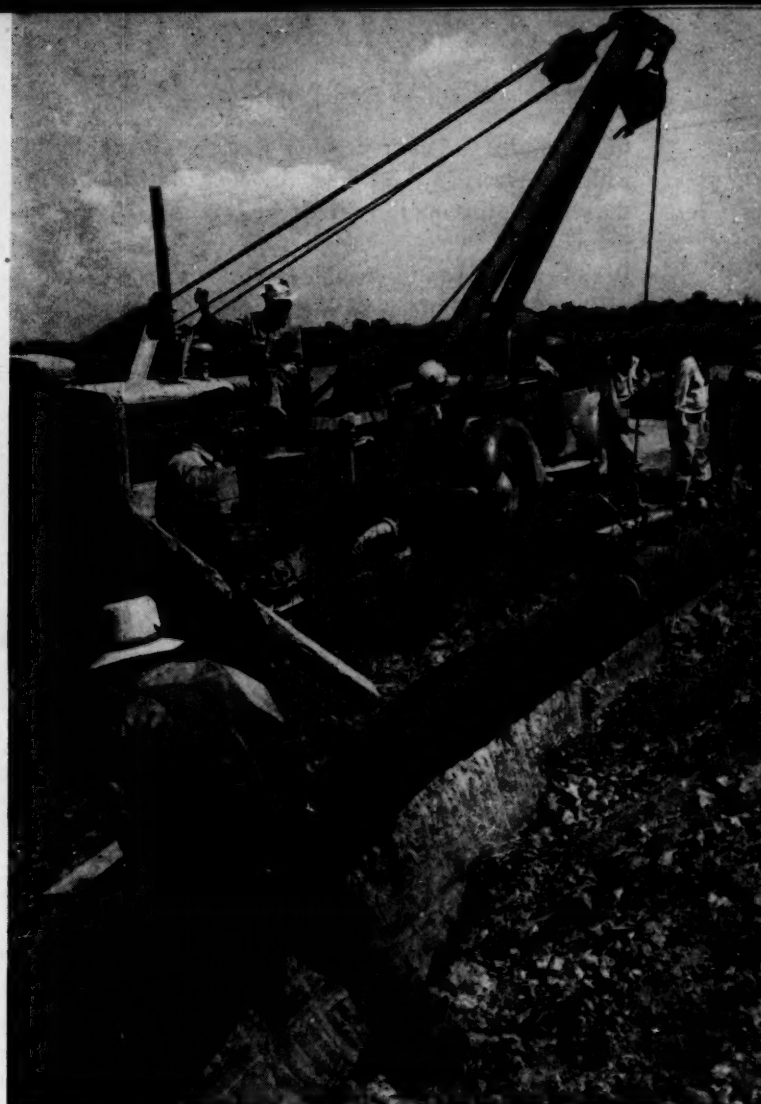
Let us take a look at this 1.5 million barrels per day of World War II requirements. In a paper presented before the Senate Special Committee to Investigate Petroleum Resources, Mr Ralph K. Davies, Deputy Petroleum Administration for War, wrote:

Military gasoline consumption at the peak of World War II was 100 times that of our overseas forces at the peak of World War I. The American Army and Navy had 600 times as many automotive vehicles as the AEF had in Europe in 1918. The Navy and Merchant Marine have more ships and more tonnage than the combined Merchant Fleets of the world after the last War. The Army and Navy operated 1,250 per cent more planes before V-E day than they did before Pearl Harbor.

While it may be true that the rise of oil consuming machines in the next war may not be so great, percentage wise, as it was between the first two World War, there are certain indications that there will be a rise in consumption.

✿ ABOUT ONE-THIRD of the 1.5 million barrels per day of World War II usage was in aviation gasoline. If we started a war tomorrow we would start it with the majority of the Air Arm planed with World War II aircraft. The number of jets in service now is relatively small compared to our overall complement in war. As this war progresses, though, jets will be battle tested, and if found battlewise, we can expect a large increase in their numbers and use. This alone will increase the use of petroleum products approximately three-fold. However, there is some compensation from the increased use of jets. They do not require the highly refined "souped up" gasoline of above 100 octane as do the present engines of the reciprocating type. The main requirement of jet fuel is the production of heat and in some cases this can be produced with kerosene. But kerosene or gasoline (at the present time) require crude oil as a base and the overall consumption will increase.

It is the law of physics that as the speed of a fuel driven vehicle increases its consumption of fuel increases. This is true of ships, planes or motor vehicles. When the submerged submarine had a speed of about six knots the surface speeds of commerical and man-of-war ships of the order of 10 to 20 knots was sufficient. However, submarines are no longer slow boats. It seems certain then that the new ships will be designed with increases in speed. This will increase the need for oil. The ships



*Gulf Oil*

**Laying Gulf Oil pipeline. Pipelines have long been important in transporting crude oils and natural gas.**

which we would take into this war, of course, be those now in the "moth-ball" fleet. The number of these to be uncovered will be determined by our needs for ships and that need will depend on who we fight. If we uncovered all of them, which seems likely, our consumption of black oil would be about the same as in the last war.

Taking these factors into consideration it seems reasonable to believe that our military requirements in the next war will be about the two million barrels per day above our present production that Mr Forrestal has given as our needs for total production. If we take this figure and add it to the 5.5 million barrels per day for civilian consumption we can come up with a requirement of 7.5 million barrels per day. Where are we going to get it?

✿ MENTION was made previously to the development of the proration method of restricting production from the wells of the United States. This method was one in which only the individual states could act but in order to act intelligently some sort of a yardstick of produc-

tion required to meet demand was in order. Starting with the Sherman Anti-Trust Act and continuing down the years with interpretations of that Act by the Supreme Court; through the rise and fall of the National Recovery Act; and the establishment of a system of forecasting by the Bureau of Mines, there has developed a method whereby each producing state is given a quota of the estimated demand for its share of the production.<sup>4</sup> As an example, during the month of April State "X" is allocated as its share of the national production a total state production of three million barrels. State "X" has 3,000 producing wells. Therefore the state prorationing authority issues the necessary instructions to limit the production of each well to 1000 barrels per month or  $33\frac{1}{3}$  barrels per day. Those wells in the state which cannot produce  $33\frac{1}{3}$  barrels per day are allowed to produce what they can; those which can produce more are limited to  $33\frac{1}{3}$  barrels per day plus the overage from the poor producers. Under such a system neither the individual productive capacity of the good producer wells nor the optimum desirable production of all wells or fields are taken into consideration. The net result of such a system is to set up a "demand" which is an estimate of the amount of crude oil required to balance the expected need for crude oil and thereby *maintain the price of crude at the desired level*. Thus the production of crude oil within the United States is throttled or controlled to maintain a level of production roughly equal to consumption. Therefore, the present "demand" figures and the production figures of crude oil do not represent the productive capacity of the fields of the United States either at a "free economy" level or an optimum desirable level for maximum production of oil through elapsed time. From this I have come to the conclusion that the supply of crude oil which could be produced from the wells of the United States is an unknown amount but it is considerably above that of present day production. There is an indication in *Petroleum in War and Peace*<sup>5</sup> that during the last half of 1944 and the first three quarters of 1945 we were producing crude oil at a rate above the "maximum efficient productive capacity" of the wells. Our maximum efficient productive capacity at that time (1945) was considered to be about 4.5 million barrels per day and we were actually producing about 5 million barrels per day. This from 412,220 wells drawing on a 20 billion barrel reserve. However, in 1947, 403,797 wells, drawing on a 23.8 billion barrel reserve, produced an average of 5.2 million barrels per day with no mention made of the "maxi-

<sup>4</sup>For an interesting discussion of this development see *A National Policy for the Oil Industry*, by Eugene V. Rostow, Yale University Press, New Haven, 1948, pp. 16-53.

<sup>5</sup>*Petroleum in War and Peace*, papers presented by the Petroleum Administration for War before the Senate Special Committee to Investigate Petroleum Resources, Washington, 28-30 November, 1945, Chart #7.

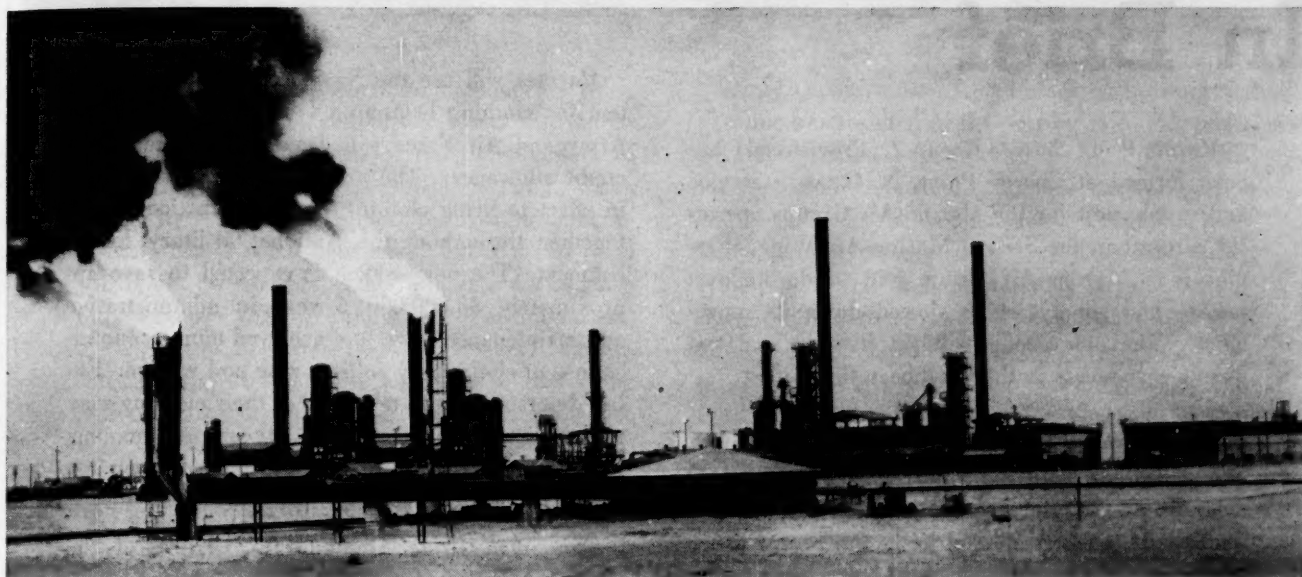
mum efficient productive capacity." But, in view of the fact that we will require some 7.5 to 8 million barrels per day of *refined products*, it is not too important at this time to belabor the productive capacity of crude oil in the United States when the bottleneck is refining capacity. The Oil and Gas Journal<sup>6</sup> estimates that by early 1949 the refinery capacity of this country will be of the order of 6 million barrels per day. Assuming for the moment that this estimate is correct, it means that to supply 7.5 or 8 million barrels per day of refined products we must import 1.5 to 2 million barrels per day of those refined products. It would be perhaps closer to the truth to say that we will require 1.5 to 2 million barrels per day of refined products. It may be to our advantage *not* to import these products, but to ship them from point of origin direct to the combat zone, by-passing the United States entirely. Therefore, let us take a look at the refinery capacity of major points of supply outside of the continental United States.

◆ UNLIKE THE UNITED STATES, wherein refining production is to a great extent concentrated near major markets, the main refineries of world production are located at or near the major pools. Some nations require, as a prerequisite to entry, that the crude oil products to be used in that nation be refined within its borders. These countries are few in number and relatively small as consumers, therefore they, for the purpose of this discussion, may be disregarded. It has been estimated that as much as 20 per cent can be saved on shipping space alone by refining at the production center rather than at some point closer to the consumer. For oil which comes from "out of the way places" this saving in shipping alone is a considerable one.

In line with this discussion of the saving in shipping space by refining at the point of production we should look first at those points of production wherein shipping distances are the shortest to the point of our needs. That, in general terms, means the Western Hemisphere. Of the several refining areas in the Western Hemisphere there is only one which is located in an area where there is relatively little or no domestic demand. That area, of course, is Venezuela and the Netherlands West Indies. The principal refinery is at Aruba. In this area the daily production of refined products is on the order of 840,000 barrels. At the present moment the majority of this production is going to Western Europe to aid the recovery of that area. As other areas come into production and are able to take up this load, some or all of this capacity could be acquired for our use. But as of now the capacity is somewhat less than one million barrels per day and we need two million. Canada, Mexico, and the countries of South America use up almost all of the products they refine and there is no

<sup>6</sup>29 July, 1948, issue, p. 201.





Aramco

Arabian American Oil Company's refinery at Ras Tanura, Saudi Arabia. The refinery output is 135,000 barrels of processed products daily. American concessions control most of oil found here.

indication at present that any appreciable increase in refining capacity will result in an exportable surplus.

In looking at the Eastern Hemisphere the only areas of refinery production which are able to export some of their products above that required to keep the area in operation are those of the Middle and Far East. The Middle East may be divided into two areas of "influence" which in effect determines the ultimate destination of the products. In Iran and in part of Iraq, England and English controlled companies hold the major concessions and control the refined products. In part of Iraq, Kuwait, Bahrain and Saudi Arabia, American concessions control part or all of the oil found there. From this part of the Middle East we could expect to get some refined products. However, should the war include most or all of the nations of Western Europe we would have to make available enough oil products for them to conduct a war and that would take the majority of the oil refined in our part of the Middle East. On the basis of taking all of the oil out of that part of the country that we could get our hands on, to help conduct a war, we might figure on some 200,000 to 300,000 barrels per day. Even this latter figure would not increase the available supply of refined products much over the one million barrel per day mark. This leaves us short of our war requirements by an amount equal to something between .5 million and 1 million barrels per day.

The other area having refineries in the Eastern Hemisphere and located in an area of low consumption is that of the Netherlands East Indies. Here, however, if and when the production gets back to pre-war levels, it will just about take care of the demands of the Far East. This will have a beneficial effect on our domestic situation for it will relieve the West Coast of the United

States of some of its burden of exports to the Far East. This is somewhat of a negative gain if I may be permitted the use of such a phrase.

The outlook is none too bright. We are putting into the hopper a demand of eight million barrels per day in an estimated world demand of nine million barrels per day. Of this eight million barrels we probably can produce and refine something on the order of six million barrels with our present and projected equipment. We are then going shopping in the world market, whose stock is about three million barrels per day, which has steady customers for well over three-fourths of its daily supply, and we are going to attempt to buy two-thirds of that supply. If we get it we will certainly pay through the nose for it. That much is certain. However, granting that we can buy, beg, borrow or steal it we will have to get it from its location to the place where we want to use it. That is a job for the tanker fleets and in submarine infested waters tankers are prime targets.

So far in this discussion I have treated all of the world's oil as being available to us in the event of another war. This, of course, is naive. We can bank on any enemy, worth his salt, grabbing all of the world's oil that he can get his hands on before we do. Then we will be in a position where we will either have to make do with what we have or retake that which we need. Pending the spelling out of an enemy we can only speculate on which of the present fields he will get and which we may be allowed to keep. It appears to me that if we are unfortunate enough to come to another war of World proportions the people of the United States are going to be riding Shank's Mare and sleeping in cold houses while the boys in Sky Blue, Navy Blue and Khaki settle the matter.

USMC

# In Brief

*Marine Wing Service Group 2* (Provisional) has been formed at Cherry Point, N. C., as a service and supply unit for the Marine Air Groups operating aircraft in the Second Marine Air Wing. Previously a Marine Air Group had to do its own service and supply which slowed down its movement. The new group will get its first real test during maneuvers in the Caribbean this winter.

*One pass* is all the "Vittles" pilots get at Berlin's Templehof Air Base, it was learned from the AACS recently. If the pilot does not succeed in making a landing on his first attempt he has to return to his home base because the spacing of landing is so compact—3½ minutes interval—that a go-around cannot be effected. Missed approaches are a rarity, it was learned, as Ground Controlled Approach has become a primary method of "letting down" aircraft through the soup.

*Consolidation of responsibility* for all sea transportation and supporting facilities under the Navy has been approved by Defense Secretary Forrestal. The actual transfer of Army Transportation Corps cargo and passenger ships to the Navy will probably take over a year to accomplish.

*Four types of lightweight* equipment capable of airborne transportation are being developed under a Navy Bureau of Yards and Docks program in which aluminum or other light materials are used in place of steel. The equipment under development includes a diesel-driven 60-kilowatt generator set; a six-by-six foot motor grader; an air-cooled 260-CFM air compressor, and a portable welding unit. Lighter metals are used only where they do not impede the performance or wearing ability of the equipment.

*The Douglas C-124A* will carry a 50,000 pound load, and can transport military cargo 1,200 miles and return to base without refueling according to the Douglas Aircraft Company of Santa Monica, Calif. A novel built-in nose ramp, similar to that of the LSTs, facilitates handling of heavy ground force equipment such as tanks, field guns, bulldozers and fully loaded vehicles. The Air Force has 28 of these giants on order.

*Marines* will use the Navy's cash allowance system for clothing beginning 1 July 1949, while the Army and Air Force will draw clothing against a credit allowance. The new system is being placed in effect to bring clothing issuance practices closer together throughout the National Military Establishment. The new system is expected to save approximately \$8,000,000 a year in administrative and maintenance costs, and achieved more economical use of clothing by enlisted men and women. Enlisted personnel who take care of their clothing may gain about \$25 a year, since any unused amounts of clothing credit will be given to them in cash.

*The Small Arms* Ammunition Division of the Ordnance Department has recently developed a 2-draw process for manufacturing caliber .30 brass cartridge cases—replacing the previous 4-draw method. By so doing, five operations can now be eliminated, thereby reducing the over-all cost of manufacture per unit cartridge and speeding up production. In the near future this method will be used for the regular manufacture of 500,000 cartridges.

*Enlistment of non-veteran women* for service in the regular Marine Corps has begun. With a planned strength of 839 women in the regular service by 1 July 1950, the Marines have already selected more than 200 to transfer in the rank they formerly held in the Women's Reserve. Recruits are to be trained at Parris Island, S. C., with each recruit class limited to 50 women marines. The first training period is scheduled to begin 1 March.

*Three high-ranking officers*, representing the Army, Navy, and Air Force, are working on the standardization of clothing and personal equipment for the armed services. Technicians of the committee already are near agreement on several items, such as arctic mittens, cotton drawers, flight face masks, and summer flying suits. Many similar items probably will be approved soon for standardization, but numerous others are expected to provoke long debates. Uniforms, insignia, and distinctive items of outer clothing which identify the service of the wearer are not being considered for standardization, although studies are being made of the materials used.



*Honorary recruiting warrants*, or honorary titles, to individual, animal, or other subjects will not be awarded without approval of the Commandant of the Marine Corps, it was announced recently. When certain individual cases appear to merit special consideration and when beneficial publicity and good will might be created by the designation of such a title the case will be submitted to Headquarters, Marine Corps, for approval. Two types of "Certificates of Appreciation" are available for deserving individuals or organizations. One is for assistance and cooperation in the interest of the regular Marine Corps. The other is for assistance and cooperation in the interest of the Marine Corps Reserve.

*The Martin Mauler*, combining the heaviest concentration of torpedoes, rockets, and machine guns ever incorporated in a single engine carrier-based aircraft, is now undergoing carrier tests on the USS *Kearsarge*, operating off the East Coast. With a gross weight of more than 22,000 pounds, the Mauler is one of the heaviest airplanes ever designed exclusively for carrier duty. Powered by a single Pratt and Whitney R-4360-4 engine, the Mauler has only a pilot for crew. Except for guns mounted in the leading edges of the wings, all armament is carried in shackles under the wings and fuselage. It has a range of more than 2,000 miles and a maximum speed of more than 300 mph.

*Temporary promotion to next higher grades* is due for 1,832 Regular and non-Regular Army officers on active duty early this year, the Army announced recently. An additional 917 officers will be placed on eligibility lists, to be advanced as additional vacancies occur. These temporary promotions, the first to be made except from second to first lieutenant since March 1947, reflect Army grade requirements based upon its November 30 strength, personnel officials said.

*An Air Academy* similar to the Army's West Point and the Navy's Annapolis is contemplated by the National Military Establishment. In the meantime, Defense Secretary James V. Forrestal has authorized the Air Force to obtain officers from the 1949 graduating classes of the Naval and Military academies. Up to seven per cent of the Annapolis graduates and 40 per cent of the West Point graduates will go into the Air Force.

*Army Quartermaster Corps research* in congealed gasoline has resulted in the perfection of this newly developed material to a point where it is practical for use, after reconversion, in internal combustion engines, jet motors, and for fuel. Congealed gasoline does not explode, nor does it ignite readily. It may be stored in open bins and shipped in ordinary freight cars like coal. It is possible to convert any grade of gasoline, kerosene, fuel oil, or any other petroleum product into a semisolid or even solid state without changing the characteristics of the original fluid. Reconversion to the fluid state is accomplished by compression.

*The JT-6B Turbo-Wasp* jet aircraft engine has successfully completed its official 150-hour military qualification test with static thrust rating up to 5,000 pounds, the highest yet attained for any American jet engine, the Pratt and Whitney Aircraft Division announced recently. A pure jet propulsion power plant, the JT-6B is a single-stage, double-entry centrifugal compressor, with nine combustion chambers and a single-stage axial flow gas turbine. The basic design of the engine was done by Rolls-Royce, Ltd., in England.

*A new auto-pilot*, capable of flying large transports under the most unfavorable weather conditions and capable of a fully automatic letdown to a runway, is the Navy's latest contribution toward solving the all-weather flying problem. Initiated in 1945, the early research was carried on by the Special Devices Center of the Office of Naval Research with the experimental development and installation accomplished by the Minneapolis-Honeywell Company. While the device is still in the experimental state, it is now considered sufficiently perfected for demonstration. Stallproof, the system is capable of controlling the plane automatically at high or low airspeeds, in any condition of loading, and guiding the craft on a beam to a complete touchdown on the runway.

*Navy's air strength* will reach 14,500 planes by July. In 1949, 1,165 Navy planes will be built, including 576 jet fighters, 454 attack aircraft, 82 patrol planes, 16 transports and 37 helicopters. About 3,000 World War II-type planes now in storage will be reactivated.

# Do You Want a Smaller Radio?

By LtCol Roger C. Power, Jr.

IN THE FALL OF 1944 THE ARMED FORCES OF OUR country were given effective antiaircraft and field artillery shells containing what is known as the VT or "Proximity" fuze. This fuze had behind it several years of intensive effort by civilian and military engineers and designers to produce a miniature radio transmitter of such size that it could be installed in the fuze of a large caliber shell.

Most of us are familiar with the tubes, resistors, capacitors, etc. that go into the make-up of a normal military radio transmitter and receiver. In order to obtain a transmitter and receiver that would be of "fuze-size," it was necessary to reduce all of these components to miniature and even what is now called "sub-miniature" size. These sub-miniature components, of necessity, had to have the same, or very similar characteristics, to the normal size components. That is, they must operate under the same external conditions, and must give the same power output, consistent with input, as the larger components.

As has been stated, this development was successful, and we obtained an effective weapon.

Since the last war, much more emphasis has been placed on a continuation of a development of the sub-miniaturization techniques previously developed with a view toward obtaining smaller and smaller components which would lead to smaller and smaller radio equipment. The use of circuits "printed" on paper laminations or ceramic and resin plates has been one of these developments. While these printed circuits have not received widespread military usage as yet, they are being applied commercially to such appliances as hearing aids, and, with further development, should lend themselves readily to production line manufacturing techniques. It is readily apparent that such printed circuits, in order

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*LtCol Roger C. Power, Jr., last appeared in the Gazette in January with Communications—How? He is attached to the Office of the Chief of Naval Operations.*

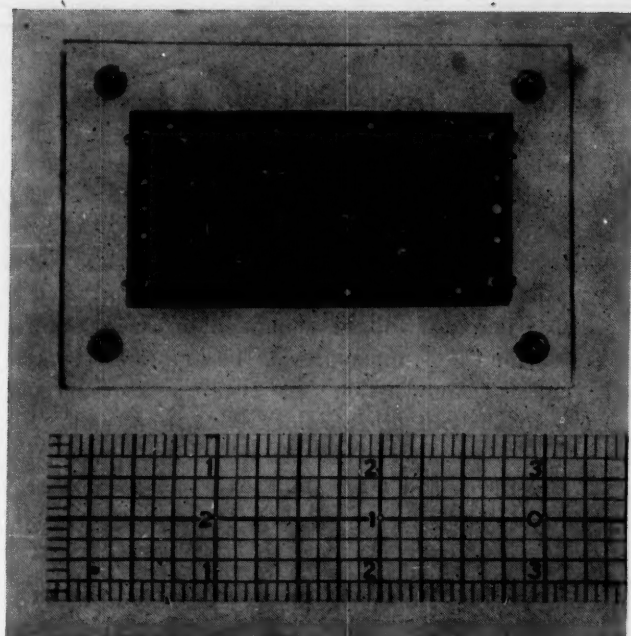


Plate I: Three-stage amplifier (less sub-miniature tubes) printed on isolantite by Naval Research Lab.

to have military applications, must be cheap to manufacture, since they cannot readily be repaired. In fact, in the event of a failure in any part of such a circuit, it would have to be discarded and replaced by an entirely new one. This, of course, would be an advantage of such circuits, because the maintenance problem would simply become a replacement problem and would not necessarily require highly trained technicians. Plate I is an example of such a circuit, produced by the Naval Research Laboratory, printed on isolantite.

Other techniques have been reductions in size and weight of tubes, resistors, capacitors, cable, cable connectors, meters, rectifiers, crystals, and all other items that go to make up a radio equipment. Today, the "Dick Tracy" wrist-radio is an actuality, and is made of a combination of printed circuits and sub-miniature components. A comparison of some of the former type components to the miniature components is given in Table I. The ratios of weights and volumes disclose the startling results achieved. For example, certain rectifiers have been reduced to 1/35 of their former weight and 1/148 of their former volume. Perhaps more graphic illustrations are the accompanying photographs showing, in Plate II, the comparison between similar normal and miniature cables, in Plate III, the comparison between similar normal and miniature meters, in Plate IV, the comparison between similar normal and miniature potentiometers; and in Plate V, the comparison between normal and miniature rectifiers. From these photographs it is easily apparent that an effective reduction in size and weight of our field radio equipment is practicable in the not-too-distant future.



## Why can't we have a radio weighing two pounds that will work all around the world at all times? In two or three years we might. Sub-miniaturization of component parts will give us lightweight, immersion-proof communications equipment

While the reduction in size and weight of any radio equipment is of paramount importance to any person in the Marine Corps, equally important are the requirements that such radio equipment be sturdy, waterproof (preferably immersion proof) and easily maintained or repaired.

The very fact that miniature and sub-miniature components are so small would tend to make them less sturdy and harder to maintain and repair though their water-proof characteristics might remain the same as the normal type components. This lack of sturdiness and difficulty in maintenance and repair naturally became a problem that had to be overcome prior to the adoption of miniaturization techniques in the construction of military radio equipment. It is indeed fortunate that since the last war, due to the efforts of governmental and commercial laboratories, a new and unique technique for the protection of entire circuits has been developed. This technique is known as the "potting" of circuits.

Most of us are now familiar with a process developed during the last war, of protecting ID cards by embedding them in a transparent plastic that would render them impervious to the elements. At the conclusion of the last war, engineers working with miniature components began to wonder why such embedding in plastic could not be applied to electronic circuits. Naturally the plastic used for ID cards would not necessarily have the characteristics that would render it suitable for enclosing electronic circuits. Such a plastic would have to have a high mechanical strength; it would have to have a coefficient of expansion similar to the material it encased so that temperature changes would not damage the electronic circuit; it should not be affected by external conditions over a wide range of ambient temperatures, and

it should have electrical properties such that it did not affect the circuit it encased.

After intensive research which utilized much of the "know-how" of the recently developed, mammoth U.S. plastics industries, several plastics were developed which met the specifications listed above. Some of these plastics were developed by the National Bureau of Standards, Naval Research Laboratories and Melpar Inc (Electronics), aided by resin manufacturers, and are known as casting resins. These plastics have exhibited a host of characteristics when used to embed electronic circuits. Characteristics of interest to us in the Marine Corps are:

1. Potted circuits are sturdy in that they resist mechanical shock and rough handling.
2. Embedded circuits are not affected by the plastic either chemically or electrically.
3. The plastic has a high degree of resistance to salt water corrosion and circuits embedded therein are practically submersion proof except for the prong connectors leading out of the potted circuit.

Thus we now have a method whereby entire stages of radio transmitters and receivers, constructed entirely of sub-miniature components and mounted on a small chassis, can be completely embedded in plastic leaving only prone plugs coming out of the plastic. Such complete encasing is another advantage of the "potted" circuits, since it will allow radio equipment to be constructed on a "plug-in" basis greatly alleviating the maintenance and repair problem so prevalent today. The accompanying photographs, Plates VI and VII, show two examples of the "potted" circuits which can be constructed today. One of these circuits was "potted" by Melpar, Inc. (Electronics), a commercial firm (Plate VI), and the other

TABLE I: COMPARISON OF CERTAIN MINIATURE RADIO COMPONENTS WITH SIMILAR FORMER TYPE

COMPONENT	MINIATURE (Weight in ounces)	FORMER TYPE (Weight in ounces)	RATIO OF WEIGHTS	RATIO OF VOLUMES
1. Tubes	0.11	2.5	22:1	26:1
2. Cable	0.05/ft.	3/ft.	60:1	11:1
3. Rectifier	0.022	0.75	35:1	148:1
4. Meter	1.5	13	8:1	22:1
5. Connector	0.34	5	15:1	12:1
6. Crystal, Quartz (HF)	0.17	5	30:1	88:1
7. Capacitor, Variable	0.29	3.5	12:1	12:1

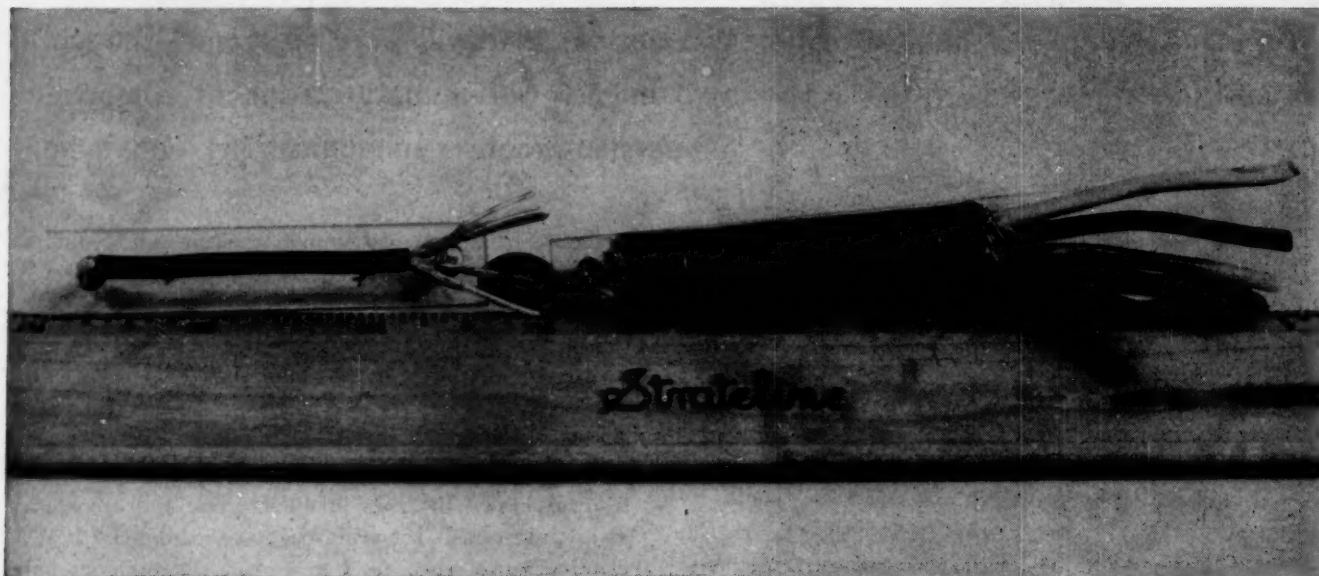


Plate II: Comparison between normal and subminiature types of five-conductor cables. Effective reduction in size and weight of field radio equipment is practicable in the not-too-distant future.

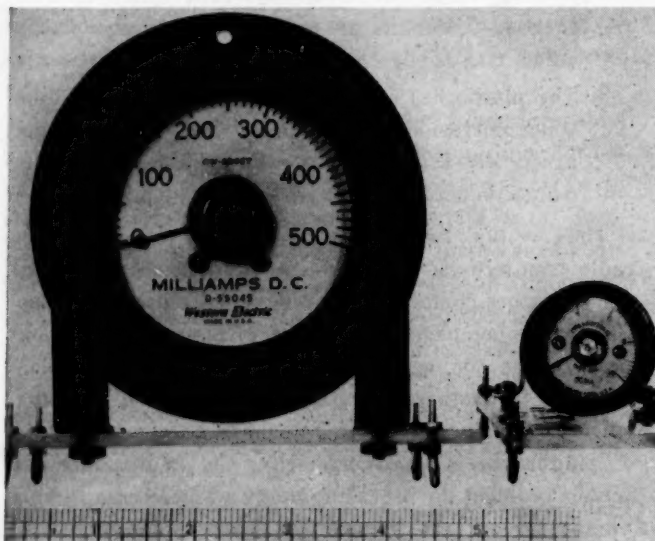


Plate III: Sub-miniature meter has added advantage over normal size; it is able to operate under water.

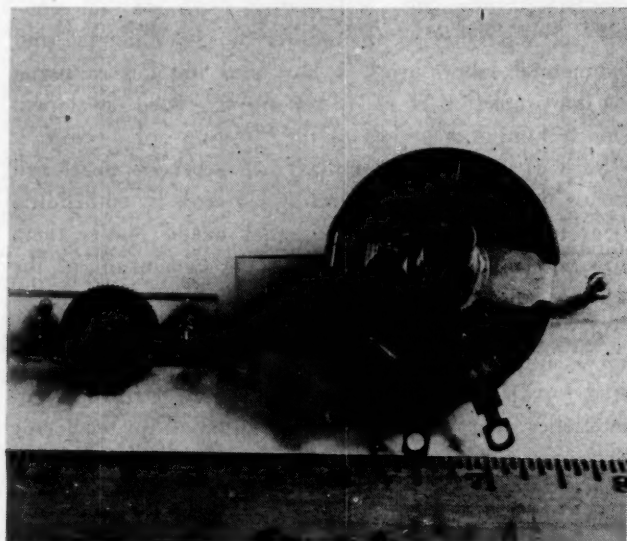


Plate IV. Reduction in size is shown between normal and sub-miniature types of similar potentiometers.

by the Bureau of Standards (Plate VII). It is indeed easy to visualize how an entire radio can be constructed utilizing these "plug-in" components and with spare components accompanying the signal supply section so that entire stages of radio can be replaced in a matter of minutes.

It should be readily apparent that, with the proper utilization of this new development in electronic techniques, we in the Marine Corps should soon be able to obtain radios which are light in weight, small in volume, sturdy, immersion proof, and which do not require multitudinous technicians to maintain in a reasonable operating condition.

Don't look for such equipment to be delivered tomorrow, because often times two or three years elapse before a new development can be placed in a production status. Also, in peacetime we have the old bugaboo of "not enough money", so that procurement of such equipment may take many years waiting for funds to become available. The promising feature is that such techniques as miniaturization, sub-miniaturization and potting are an actuality which will eventually be incorporated into our equipment and possibly be the answer to the question asked every communicator "Why can't you get a radio weighing two pounds that will work around the world at all times?"

USMC



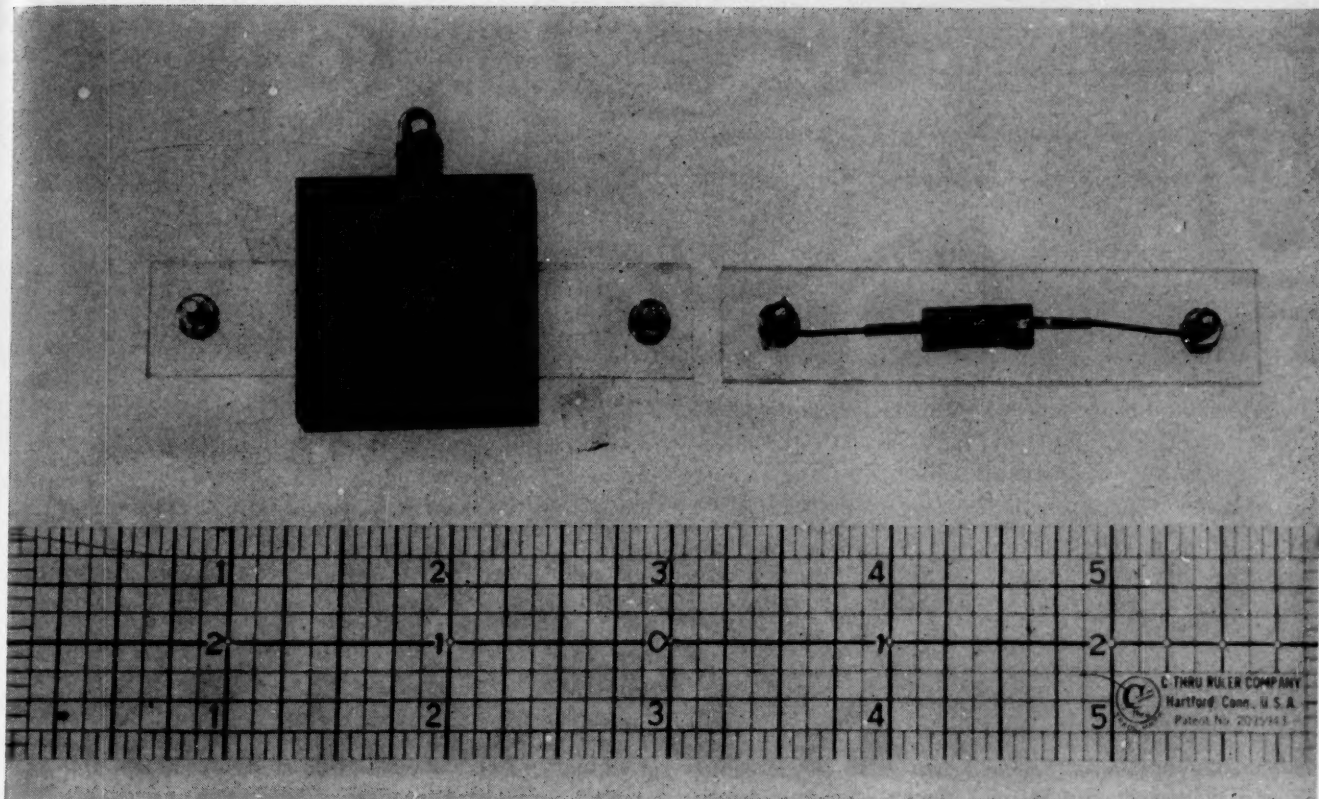


Plate V: Comparison between normal and subminiature types of similar rectifiers. Certain rectifiers have been reduced to as little as  $1/35$  of former weight and  $1/148$  of former volume.

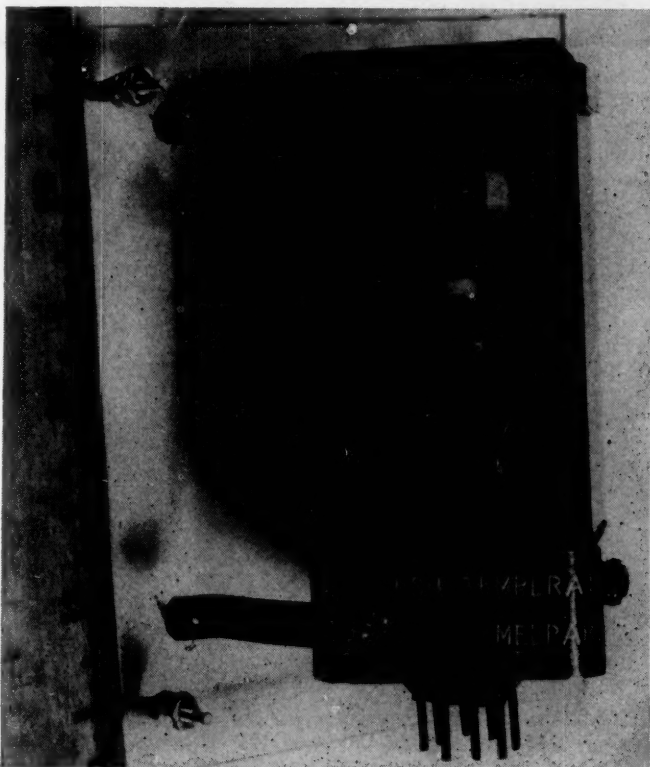


Plate VI: "Potted" pulse time modulator with 10 components enclosed and ready for tube socket.

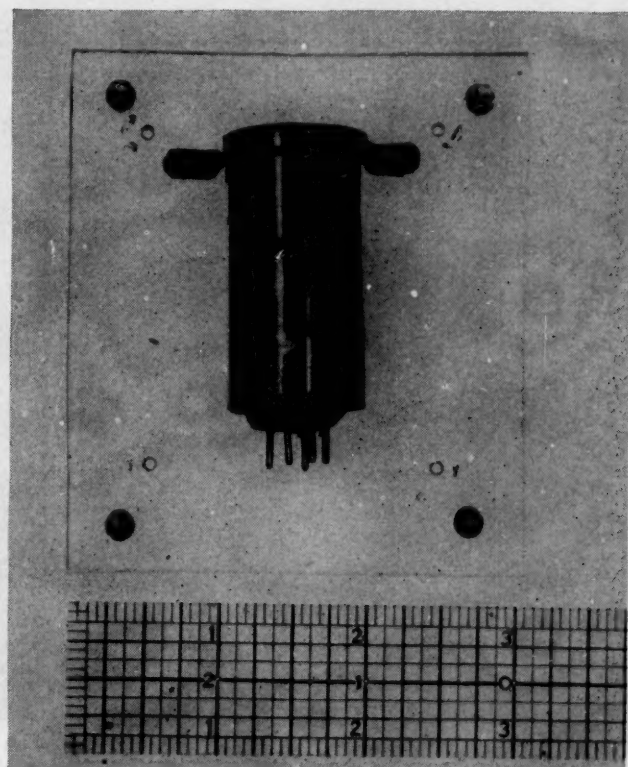


Plate VII: Two-stage amplifier "potted" with components enclosed and ready for tube socket.

# Publishing the GAZETTE

By Capt Edwin Simmons

Photos by Sgt Charles R. Strathman

✻ MOST OF OUR READERS KNOW THAT THE GAZETTE IS the professional magazine of the Marine Corps. Most also know that the GAZETTE is published by the Marine Corps Association, although not so very many may be certain as to just what the Association is. They may know that the Association was founded at Guantanamo in 1912 and that the GAZETTE came along as its official journal in 1916. Because of that they may think that the GAZETTE is an official publication of the Marine Corps. During the war years it was often confused with the now-defunct *Headquarters Bulletin*.

Actually, the GAZETTE is not *official* in the accepted sense of the word. But because Marine officers and men are assigned to it on a full-duty status and because most of its readers and contributors are marines, it does have a semi-official standing. For this reason everything print-

ed in the magazine is reviewed for policy and security by the Division of Public Information. Its contents are also controlled by an Editorial Board, whose members are officers stationed at Quantico, and by the Assistant Commandant of the Marine Corps Schools who collaterally is the editor-in-chief of the GAZETTE and secretary-treasurer of the Association.

The Association has no function other than to act as a non-profit publishing agency for the GAZETTE and its related activities. The GAZETTE, through its circulation and advertising income, and profits from the Bookshop and minor publishing ventures, is a self-financing proposition. Its revenue just about balances its expenses which is as it should be. What surplus there is is salted away in Government bonds to act as an anchor to the windward in event of dire financial distress. Such distress is not anticipated; the GAZETTE is getting along and if more money is made it will go toward making the magazine a better, more attractive publication. The only thing approaching a government subsidy is a block of unit subscriptions paid for by the Marine Corps.

Nor is the GAZETTE printed in a government printing plant or at government expense. It is printed in Baltimore by a commercial printing house which produces other specialized magazines including *Field Artillery Journal*, the *Quartermaster Review*, the *Military Engineer*, and *Signals*. Most of these journals are published under plans similar to the organization of the GAZETTE.

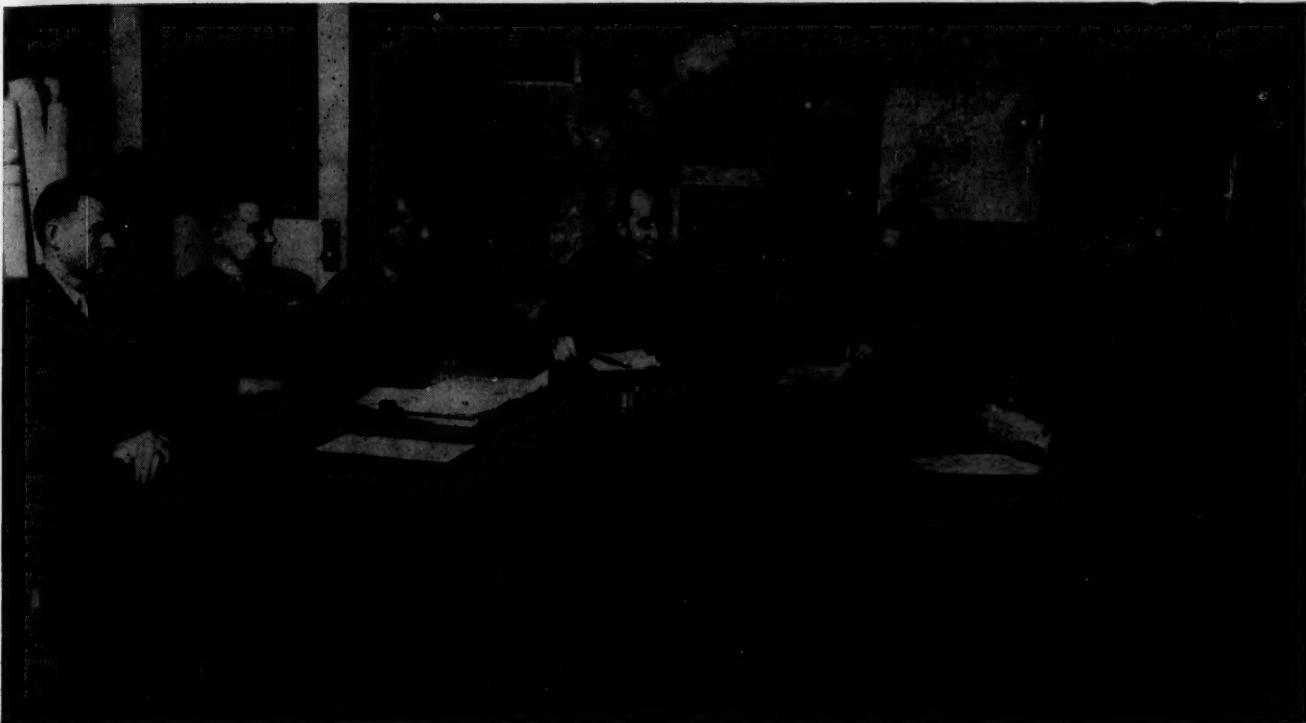


The processing of a manuscript begins when it is received, logged in, and acknowledged by GAZETTE secretary Mrs Rachel Hummell. Keeping track of the article's subsequent travels is her main worry.



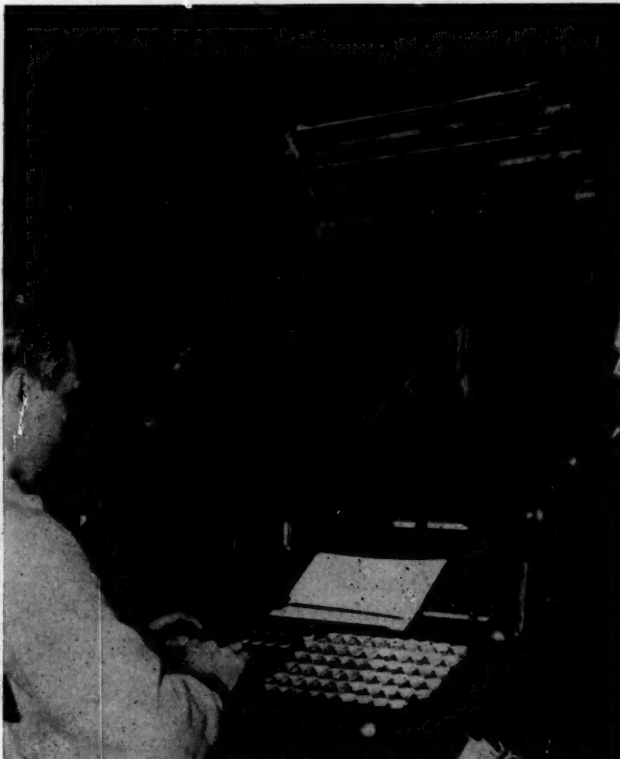
The editors, Capt Edwin Simmons and Maj Houston Stiff, give each submission a preliminary appraisal. If of sufficient interest and merit, it is referred to the Editorial Board for further consideration. Most of the contents are written by Marine writers.



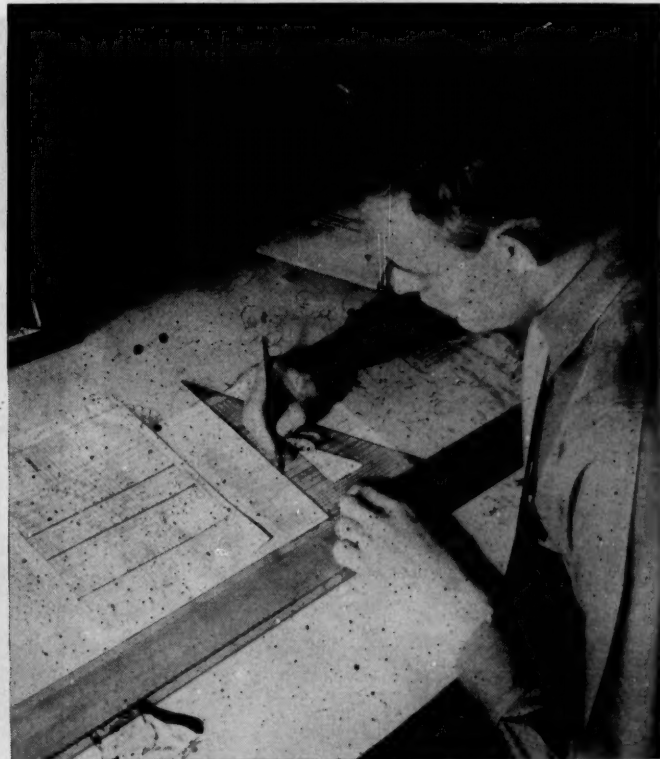


**The Editorial Board** consists of seven members plus the editor and publisher. Appointed by the Assistant Commandant, MCS, the board reviews all intended GAZETTE material for suitability, propriety, and accuracy; advises

on matters of policy and finance. Members present above, left to right, are: 1stLt C. C. Jones, Maj A. R. Cason, LtCol J. H. Brower, Col C. A. Roberts (senior member), Maj Stiff, LtCol F. R. Dowsett, and LtCol R. M. Tompkins.



**The printer** gets the article after it has been approved by the board, edited by the staff. The GAZETTE is printed commercially in Baltimore by a firm specializing in such publications. First step is setting of copy on linotype.



**Maps, illustrations, and charts** are usually prepared by GAZETTE staff members. Photographs come from service and civilian agencies or are made by Photographic Services, Marine Corps Schools. Above is staff artist PFC Art Morit.

**More Pictures** ➤



**Engraving** of the magazine's art work is done in Washington, D. C. Mr R. Lynn Anderson, vice president of the firm, is shown checking engraving material as he receives it from GAZETTE driver PFC Levi Humphreys. Engraving costs have steadily climbed since the war's end.



**Making up the magazine** is a semi-technical process involving penciled roughs, layout sheets, engraver's rules, proportional scales, rubber stamps, scissors, some imagination, and lots of rubber cement.

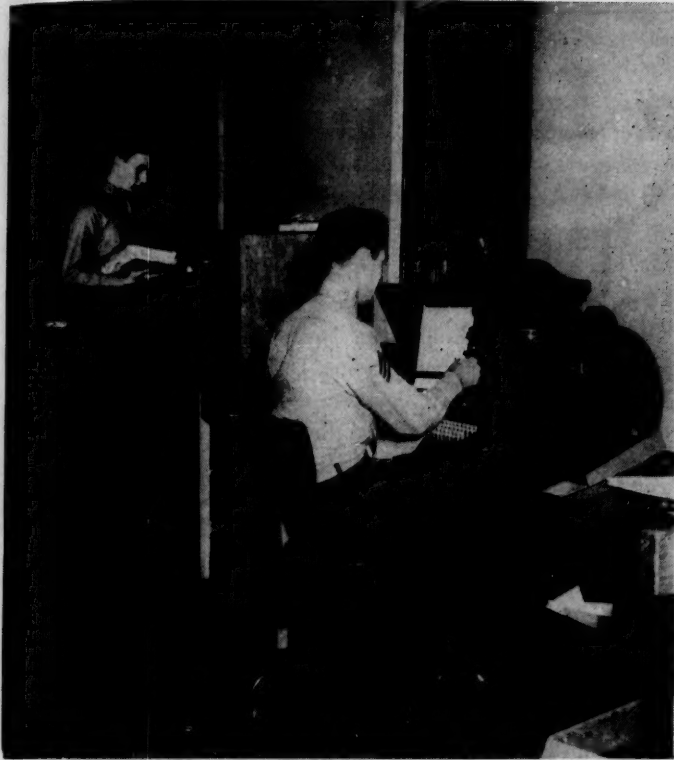


**A dummy** of the finished magazine is prepared by pasting type and engraver's proofs on special layout sheets. Editorial assistant is SSgt Thurston A. Willis, a Marine Corps veteran of 12 years' service.



**The pasted-up "magazine"** goes to the printers. Here, under the eye of the managing editor and shop foreman Theodore R. Brown, journeyman Edward O'Malley and apprentice William Wyatt arrange the galleys of type and engravings into pages.





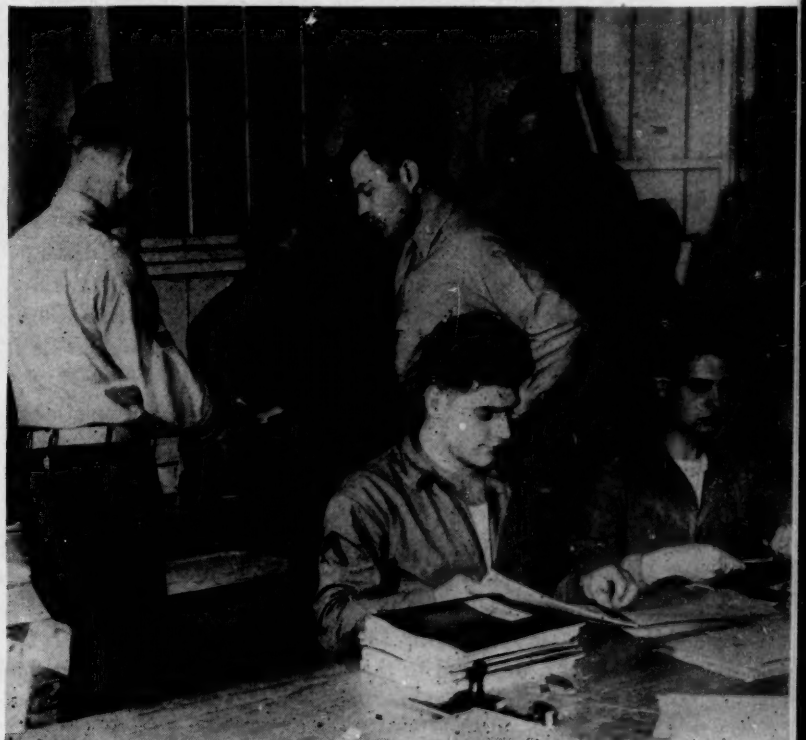
The circulation department, meanwhile, is receiving and entering new subscriptions and changes of address. At the files to the left is PFC James L. Ashley. In the right foreground at the graphotype is Sgt Thurman Albertson.



The page proofs, on their return from Baltimore, are given a final check by editor-in-chief BrigGen Dudley S. Brown. The Assistant Commandant, Marine Corps Schools, is also *ex officio* secretary-treasurer of the Marine Corps Association.



The press run of the GAZETTE now numbers about 20,000 copies; of these nearly half go to individual subscribers. Printing is done on flat bed press which runs about 1,200 sheets an hour. Foreman in foreground is George Hessler.



Distribution is made from Quantico. Standing, left to right, are MSgt Griffin H. Hamilton, 1st Lt Ray W. Arnold, and SSgt James S. Griffith. The GAZETTE goes to all 48 states, territories and possessions of the U.S.; and 25 foreign lands.

# Passing in Review

BOOKS OF INTEREST TO MARINE READERS

## USMC Monograph . . .

### BOUGAINVILLE AND THE NORTHERN SOLOMONS—

Maj. John N. Rentz, USMC, 166 pages, illustrated. Historical Section, Division of Public Information, Headquarters, U. S. Marine Corps, Washington 25, D. C. \$1.50

Bougainville and the Northern Solomons is the fourth in a series of operational monographs being prepared by the Historical Section, U. S. Marine Corps, concerning Marine operations in World War II. A complete picture of the strategic situation in the Solomon Islands is necessary in order that the reader may gain a full understanding and appreciation of the problems confronting the South Pacific planners at the time of this campaign. The author has wisely opened this monograph with an excellent presentation of strategic considerations. Although Bougainville itself is the keystone about which the campaign is presented, the reader is made well aware of the importance of the peripheral operations both during the main account and in a later chapter entitled "Subsidiary Operations." Another excellent feature of the initial chapter is the chronological account of how the planning for the main effort was continually altered to keep pace with the changing enemy situation and our growing air supremacy. The account progresses from the initial concept of a landing in the Shortland-Faisi-Ballale Area, to the Treasury-Choiseul Area, and finally, when Gen MacArthur and Adm Halsey came to complete agreement, the decision that a landing on Bougainville itself was the real answer.

The decision having been made, the considerations that led to the selection of Empress Augusta Bay as the landing area, are clearly set forth. The tactical diversion which confused the Japanese as to our true intentions in the Northern Solomons, i.e., the planning concepts of the Choiseul Raid, and the Treasury Island landing are brought out. The overall tactical plan is aptly described by an excerpt from the IMAC Report, "A series of short right jabs, designed to throw the enemy off balance and conceal the power of the left hook to his mid-riff at Empress Augusta Bay."

There is an exceptionally interesting account of the accumulation of intelligence; including brief descriptions of the various amphibious patrolling activities peculiar to the "bush" warfare of the South Pacific. A narrative

of the planning by assault units, rehearsals at Efate and Guadalcanal, and finally the approach of the transport group, carrying the 3d Marine Division, Reinforced to Empress Augusta Bay, concludes the first chapter. The description of the D-Day landing traces the actions of each unit landing in assault. Typical of these excellent narratives is the account of the landing of the 1st Battalion, 3d Marines on Beach Blue 1, at Cape Torokina, against a reinforced company of the 23d Japanese Infantry. The combat narrative of the Bougainville Landing Force is momentarily interrupted, and rightly so, to describe briefly, but adequately, the important Naval action off Cape Moltke, during the night of 1-2 November, between Task Force Merrill and Japanese Adm Omori.

Establishment of the Bougainville perimeter, and individual accounts of each of the major actions in the development of the beachhead, until the 3d Marine Division was relieved by the Americal Division, are presented in detail in an interesting narrative fashion. The chapter is concluded with a brief mention of the defense of the Bougainville beachhead by the XIV Army Corps.

The chapter on Subsidiary Operations recounts the action of the New Zealand Forces at Treasury Island, and the now famous Choiseul "all smoke and little fire" diversionary raid by the 2d Marine Parachute Battalion. Covered also in this chapter are the New Zealander's operations at Green Island in February, 1944, and finally, the last step in Northern Solomons, the seizure of Emirau Island, in March, 1944, by a composite Marine force under the command of BrigGen A. H. Noble, USMC. These last steps, along with the success of Gen MacArthur's forces in the Admiralty Islands, sealed the fate of the once dreaded Rabaul bastion. Although each of these operations were individually small, their sum effect was far reaching—so far reaching that the 3d Marine Division literally "took off their packs" that had been shouldered for an assault on the Japanese stronghold at Kavieng.

The monograph proper is terminated with a chapter entitled "Conclusions," covering Strategic Considerations, Tactical, Technical and General Conclusions.

Ten excellently organized appendices complete the monograph. The reader may find prior study of these unusually complete appendices helpful to his understanding of the main portion of the text.

This monograph was compiled by reference to some



5,000 documents, and is undoubtedly the most completely annotated historical monograph on Marine operations in World War II, to come off the press to date. The photographs are well chosen and excellently reproduced. The completeness of the diagrams, charts, and maps leave something to be desired, but in view of the fact that the Bougainville hydrographic chart did not even clearly establish the location of portions of the coastline, this lack of good maps is understandable. Particular note is taken of the 3d Marine Division's pioneering efforts in the field of close air support during this campaign. Proper emphasis is given throughout the entire account to the Marines' greatest enemy in Bougainville—the jungle. Although the author states that an account of the defense of the Bougainville beachhead in 1944 by XIV Army Corps is outside the province of this monograph, it is felt that a more complete account of this phase should have been given. This would have been particularly appropriate in view of the excellent performances of the 37th Army Division and the Americal Division; both of whom were warm friends of the South Pacific Marines.

All Marines who participated in the Bougainville and Northern Solomons campaigns will be well pleased with the treatment of this little known phase of the South Pacific War, and its presentation in its proper perspective to the overall effort in the Pacific Theater. ALBJr

### Wind Ships . . .

THE SET OF THE SAILS—Alan Villiers. 292 pages, illustrated. New York: Charles Scribner's Sons. \$3.75

This is Alan Villiers' autobiography. As such, it is a brief for sailing ships and the way of life that they represent, for Villiers is a dedicated man. The case for sail, as he presents it, is based upon two contentions: First, that a few years aboard a sailing ship provide the best bringing-up that a young man can have, no matter what his later career is to be. Second, that in a mechan-

ized world in which fuel shortages exist there is still a place for efficiently operated, cargo-carrying sailing ships.

The tall ships of the Melbourne waterfront in the early 1900s are among Villiers' earliest boyhood memories, and they continue to be vivid. When Villiers was eleven, he tried to persuade the mate of a Norwegian barque to take him on as a member of the crew, but an Australian law prohibiting the employment of boys under the age of fourteen stood in his way. Also, his father, who was an employee of the Melbourne tramway system and an idealistic pioneer in the Australian labor movement, had other plans for him, plans which included a formal education.

However, the elder Villiers died when Alan was fourteen; a year later Alan was a member of the crew of the *Rothsay Bay*, an ancient barque whose function was to bring timber from New Zealand to Australia. Young Villiers had his heart set on qualifying for command of a deepsea sailing ship.

In the period following World War I, obtaining a berth in a sailing ship became increasingly difficult. Ships which had flown the British flag were being scrapped, transformed to coaling hulks, or, in a few cases, sold to other countries. For a time, Villiers was on the beach in France, making his home in a large concrete drainpipe and eating the handouts of ships' crews, but still determined to qualify for his license in sail. Finally, the *Lawhill*, a four-masted barque of Finnish registry, took him on as an able seaman for the voyage to Australia in search of a cargo of grain.

The *Lawhill* was typical of the few deepsea sailing ships still being operated. An old ship, she had been bought cheap by her present owner, who operated her without insurance and with a low-paid crew of young boys who needed some time in sail to qualify for their European licenses. One successful voyage repaid the owner his initial investment.

A bad fall to the deck from aloft, and a slow recovery from the resulting injuries, caused Villiers to take stock

## again available . . .

The following titles by the late, famous, marine-writer Col John W. Thomason, Jr., are once again in print:

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of his chances for command of a sailing ship; he was forced to realize that they were practically nil. Berths were available in steamships, of course; but one voyage as a crew-member of a steamer convinced him that such a life was not for him. With their machinery and unionized crews, steamships seemed to him nothing but seagoing factories.

Regretfully, Villiers decided to change his occupation; he became a newspaperman, working for the *Mercury*, in Hobart, Tasmania. The call of the sea was still strong, however. When an Antarctic whaling expedition put in at Hobart to recruit crews, Villiers lost no time in joining up. For him, the result of the expedition was a book which had some success.

Other books followed; Villiers based them on voyages in the Australian grain trade. With his literary earnings, Villiers became part-owner of the *Parma*, a steel-hulled, four-masted barque. Financially, this was a profitable venture. Villiers then put his capital into the *Joseph Conrad*, a school-ship. On this venture, he eventually lost all his money. Yet he felt compensated, for he had provided some boys with sailing ship experience.

Villiers' next project was to be a series of books based upon personal experience aboard the exotic craft of the Middle East and the Orient. To this end, he put in some time aboard an Arabian *dhow* in the Red Sea. However, World War II interrupted his plans. Granted a commission in the Royal Naval Volunteer Reserve, Villiers commanded a squadron of landing craft in the Sicilian, Italian, and Burmese landing operations.

Perhaps his books do not belong on the very top literary shelf alongside those of Conrad and Melville, but Villiers writes in their tradition. His style is simple and straightforward, and he has a faculty for making an amazing amount of first-hand factual information interesting to the reader. *The Set of the Sails* is recommended reading; its value is enhanced by charts showing Villiers' major voyages and by numerous photographic illustrations.

This, of course, is the same Villiers who has in recent months contributed a number of the GAZETTE's background articles.

JRK

#### British Research . . .

SCIENCE AT WAR—J. G. Crowther and R. Whiddington. 185 pages, illustrated. New York: Philosophical Library. \$6.00

Have you ever wondered how a trailer-mounted bed spring can determine the location of a plane far beyond the scope of human vision? Have you ever wondered why your transport cruised back and forth in what was known as a de-gaussing range?

The answers to these and numerous other questions relating to the scientific aspects of World War II are

contained within the covers of *Science at War*, the work of two highly qualified Englishmen, J. G. Crowther and Professor R. Whiddington, C.B.E., F.R.S.

Greatest proportional weight is given to Britain's primary scientific achievement of the last war, the development of radar. History is blended with explanation of the successive technical processes involved in the evolution. The authors consider the various applications of radar, including fighter direction, airborne radar for interception, airborne radar for location of ground targets in night bombing, and AA gun radars for fire control.

In a discussion of British operational research, the authors disclose the attempt to reduce war to a rational process, through the combined efforts of science and the using arms and services, contrasting this with Hitler's "romantic view of war," or victory resulting from collaboration between the military command and science.

British contributions to the release of atomic energy are featured in a relatively brief section which yet manages to convey a reasonably understandable synopsis of nuclear fission.

Scientific developments in naval warfare are primarily concerned with the detection and attack of U-boats, and countermeasures adopted against magnetic, acoustic and pressure submarine mines. The operational researcher's debt to the Luftwaffe is acknowledged inasmuch as the German air arm presented the British with one of each type of mine, readily recovered, in the early stages of each new campaign, thus simplifying the development of countermeasures.

Crowther and Whiddington have managed to include a wealth of authentic information within the covers. The highly technical nature of their subject is not, however, conducive to rapid reading. Further simplification of the text in such an interest would tend to destroy the value of the work. The nutrients are made available to the reader for his mastication and digestion.

*Science at War* hides no British light under a bushel. Just praise is given to British radar development, accelerated by the German threat prior to and during the early stages of World War II, during which period their efforts out-stripped the still complacent United States. Thirty pages are devoted to tracing the development of the release of atomic energy during the period 1902-1943. The story stops short in late 1943 at which point British nuclear physicists moved lock, stock and barrel to the United States. The reader may tend to wonder what happened to the Manhattan Project after this time. Whether the abrupt halt is due to security classification or to provincialism on the part of the authors is not disclosed.

The reader will gain the impression from literal study of the book that the proximity fuze was invented by the British and perfected by them, then released to the



United States for assembly-line production. The authors claim British conception of the application of the Doppler principle and of very rugged valves (tubes) able to withstand the shock of firing. No mention whatsoever is made of Brunetti, of the United States National Bureau of Standards, nor of his provision of the missing link, the printed circuit, which made the VT fuze a practical weapon.

The authoritative work is a semi-official document, having been commissioned by the Scientific Advisory Committee to the British Cabinet. J. G. Crowther is chairman of the Association of British Science Writers. Professor R. Whiddington, head of the Department of Physics, University of Leeds, served with the British Admiralty's Department of Scientific Research, and later as Deputy Director of Scientific Research with the British Ministry of Supply, during the war years. JJWJr

### Civil War in One Volume . . .

ORDEAL BY FIRE — Fletcher Pratt. 404 pages, indexed, maps. New York: William Sloane Associates. \$5.00

When this book was first published in 1935 it wasn't particularly well received. The edition was small and the writer (he wore no beard then) was less well known than he is now. However, there were those who recognized that Fletcher Pratt was writing a new kind of history and since then copies of that meager first edition of *Ordeal by Fire* have become practically collector's items. Bernard de Voto, no mean historian himself, declared it "the best one-volume history of the Civil War I've ever read."

About the only persons who might object to Mr de Voto's evaluation are the professional Southerners. *Ordeal by Fire* does pretty well explode (if it needs further exploding) the time-nurtured myth that the Civil War was the awkward crushing of a gallant agricultural South by a crude industrial North.

The first point that Mr Pratt makes very clear is that while "it is possible to say today that the material odds were overwhelmingly on the side of the North; it was by no means possible in 1861." A raw comparison of total white population gives a ratio of something like 5,600,000 for the South to 22,340,000 for the North. But Mr Pratt adjusts these figures. He shows that the far western states could contribute almost nothing, economically or in men, to the Union; and he points out that the border states furnished as many men to the South as to the North (and would have furnished more if they had not been held in the Union by Lincoln's political astuteness). Another fallacy of most Civil War population comparisons is the omission of the slave Negroes "who contributed enormously to the war potential of the Confederacy" whether they wanted to or not. A summary of Mr Pratt's adjustments results in a ratio of South 12,340,000 : North

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18,275,000 or something like two to three, certainly not an overwhelming majority when the defenders had the advantage of interior lines.

A similar reduction of the North's economic advantage is also made. The author points out that *at first* the North's industrial strength was not regarded as particularly important. Quite the converse; it was considered something of a weakness. It was the war itself that determined the importance of economic strength. This was one of the aspects of the Civil War that gave the German General Staff reason to say "It is those campaigns in America that we must study."

Mr Pratt gives high credit to Gen Winfield Scott for the basic strategy of the Union's conduct of the war. The old campaigner's idea was to contain the South along the Atlantic and Gulf with the Navy and press in from the North and West with the Army. He estimated (and quite correctly) that with 300,000 well-trained troops and three years the job could be done. President Lincoln recognized the validity of the plan while the rest of the country was still scoffing. The problem was to find suitable field commanders.

With pleasantly diverting digressions into internal political intrigues and draft riots, the rest of the book takes in order the campaigns of the war: the stalemate in the East, the McClellans and Burnside's always parried by the magnificent Lee; and the successes in the West where new leaders, Grant, Sherman, and Sheridan, were rising.

Without minimizing the Southern effort, Mr Pratt succeeds in showing that the North, too, had its share of hard fighters, gallant men, and good generals.

It is surprising that in a book as small as this, covering such a large subject and doing it quite thoroughly, so much of the material should seem so fresh and new. This, of course, is one of Fletcher Pratt's open secrets of success. The style of the book is quite similar to *The Marines' War*. He flings his readers into the present tense and marches his characters in and out of his book on cue, the whole thing as tightly and effectively written as a well-formed novel.

Unhappily, the book is not foot-noted and it does not have a bibliography. This is perhaps no disadvantage to the casual reader, but it is disconcerting to the military reader who likes to have an author state his sources. The book doesn't compare in this respect to the careful scholarship of Dr Douglas Southall Freeman. On the other hand Pratt perhaps makes up for this deficiency (also present in *The Marines' War*) by the racing gallop of his prose. Few other military historians are anywhere nearly so readable.

The present, revised edition of *Ordeal by Fire* has been brought out by the same publisher as *The Marines' War* and in format the books are quite similar. The situation maps, which are by Rafael Palacios, are excellent. EHS



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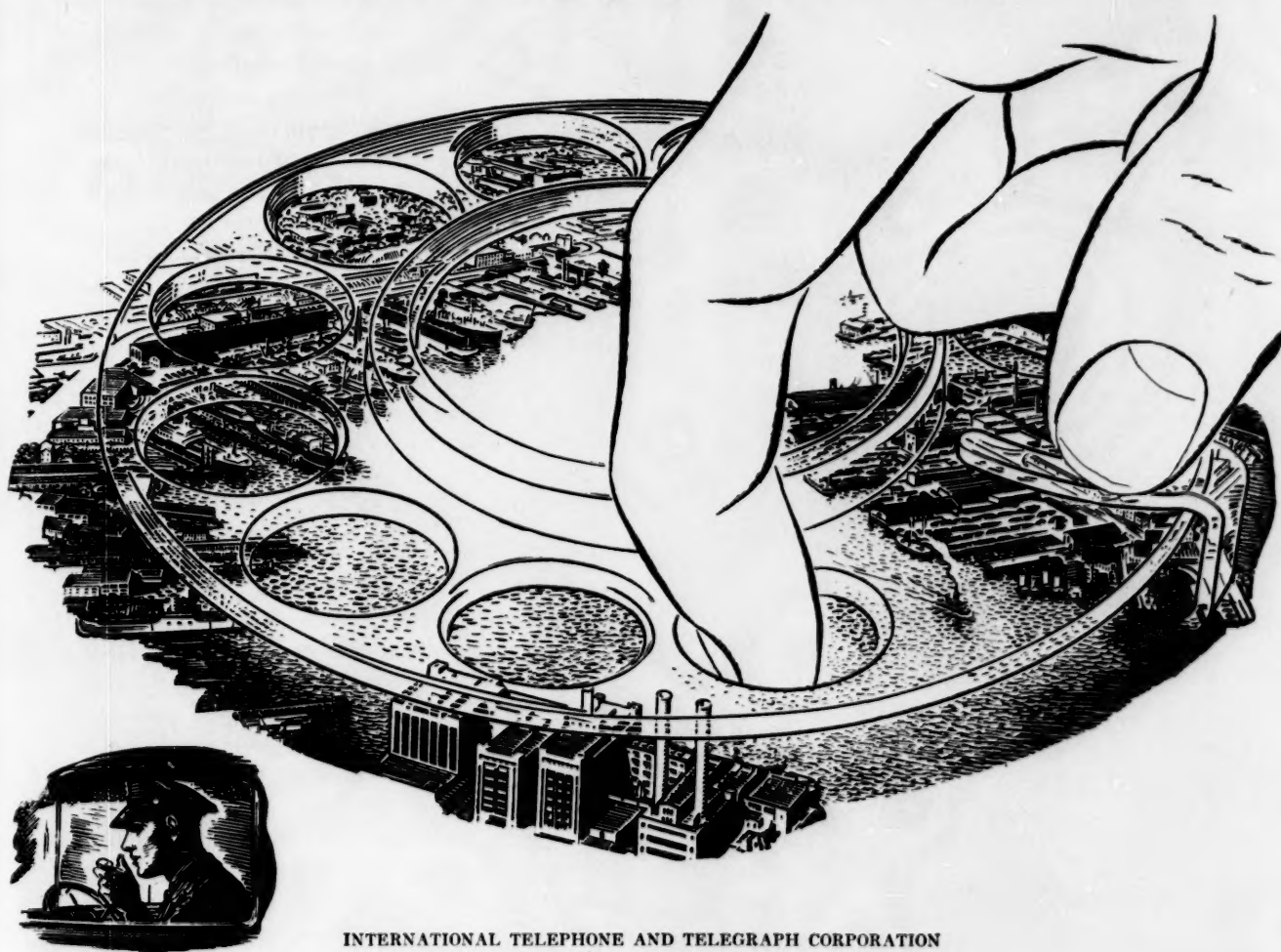
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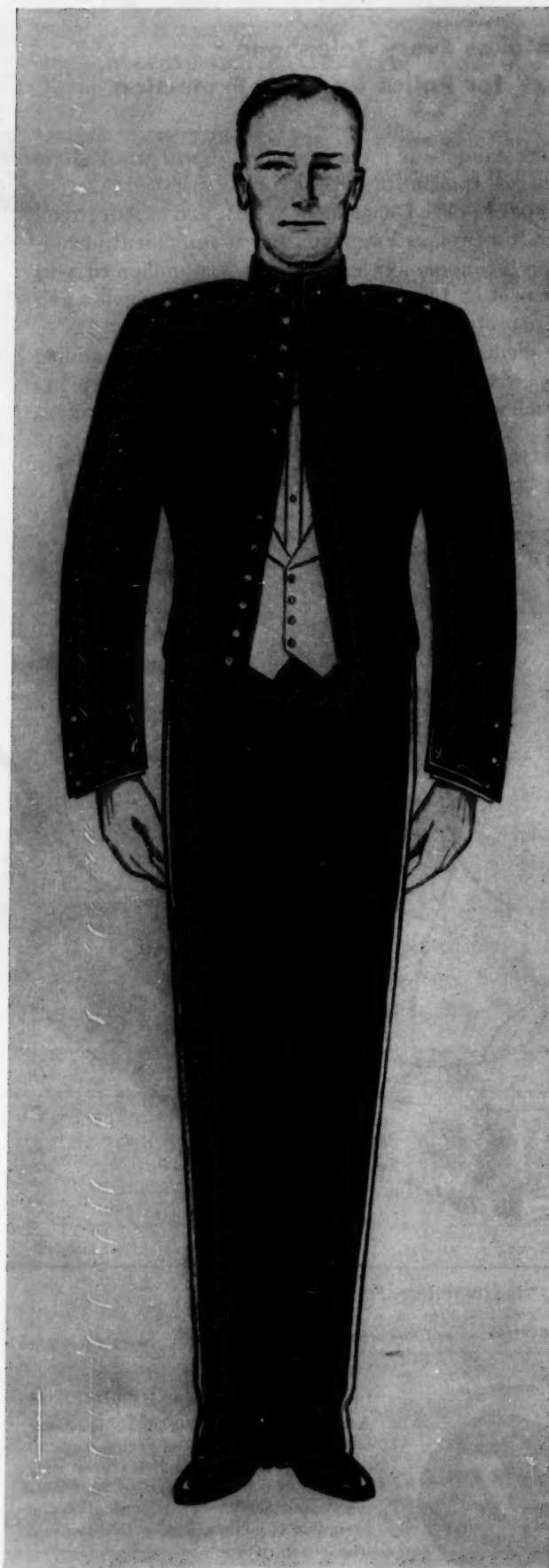
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# The Officers' New Dress Uniform

✦ A NEW EVENING DRESS UNIFORM FOR OFFICERS has been recently adopted by the Marine Corps and approved by the Secretary of the Navy. This uniform closely resembles the old evening dress uniform, with the exception that the jacket has been modified. The main modifications are the elimination of the shoulder knots, and addition of two shoulder straps attached by a 27-line gilt uniform button; the elimination of the ornamentation on the sleeve and collar and the substitution therefor of a sleeve ornamentation designed in three officer grades; namely, company, field, and general, which will be illustrated in the forthcoming regulations. The black string bow tie will be eliminated. The collar on the jacket will be a standing type, and provided with hooks and eyes for complete closure to permit wear with a white plain stiff-bosomed standing collar shirt without a tie.

Attention is invited to the fact that Letter of Instruction 1582 withdraws the requirement (Letters of Instruction 1274 and 1286) that officers possess the jacket and trousers, service, wool, green, made of 16-ounce kersey (the same material as the uniform furnished to enlisted men). These garments, under the nomenclature of jacket and trousers, service winter, are still required by officers, but may be manufactured of any cloth adopted standard (elastique, gabardine, kersey, serge or tropical worsted). The same provision also applies in regards to the khaki jacket which no longer must be of khaki when worn by officers in line with troops but may be of any khaki summer material of adopted standard (tropical worsted, gabardine or khaki suiting).

—Marine Corps Bulletin 8-48

◀ Evening Dress Uniform (General Officer)